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CHRONIC URINARY INFECTION IN INFANCY AND CHILDHOOD

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Because infection of the urinary tract so frequently complicates bacterial processes elsewhere, it is one of the commonest diseases of children and, in patients under 2 years of age, probably outranks any other. When the urinary infection is neither self-limited nor therapeutically cured within a period of from four to six weeks, the persistent pyuria quite regularly leads to the erroneous or inadequate diagnosis of chronic pyelitis or chronic cystitis. In these cases the inadequacy of the diagnosis pyelitis or cystitis is comparable to that of laryngitis when the disease is chronic pulmonary tuberculosis. It is my purpose here to demonstrate that (1) chronic pyuria is seldom the sign of an uncomplicated disease, (2) demonstration of the associated etiologic factors regularly requires complete urologic examination and (3) frequently urologic surgical treatment is demanded to control the infection or to save life. The clinical data here recorded were obtained by personal complete urologic examination of 274 juveniles with chronic pyuria. Nearly all were referred for investigation with the diagnosis chronic pyelitis.

ETIOLOGY

To paraphrase, some are born with pyuria (few), others achieve it (the usual clinical event) while others have urinary infection thrust upon them (instrumentation introduction, relatively rare) (table 1). I have seen four infants in whom pyuria was noted from birth; autopsy observations in premature children, dead soon after birth, indicate that one may correctly speak of congenital pyuria. As a rule, however, bacterial invasion of the urinary tract occurs somewhat later; in perhaps the majority of instances it runs a course of from two to four weeks and disappears spontaneously or in response to treatment. We are here chiefly concerned with the cases in which pyuria persists longer than one month. Introduction of infection by instrumentation (catheterization, cystoscopy) or by foreign bodies (needles, hairpins and the like) is of less frequent incidence in infants and children than in adults.

Bacteriology: Invasion of the urinary tract is chiefly by the gram-negative organisms of the colon typhoid group and the gram-positive cocci. Bacillus coli is most often found, particularly B. coli-communis. Staphylococci are next in frequency, followed at some distance by streptococci. The incidence of these and other organisms in our cases is indicated in table 2.

Routes of Invasion: Although most current opinion holds that urinary infection is hematogenous (so-called descending infection) from a primary focus, clinical studies in children have shown that ascending infections are by no means uncommon. Moreover, much depends on the correctness of the clinical diagnosis. I have seen juvenile patients in whom the clinical picture amply justified the diagnosis of acute renal infection, yet urologic examination revealed intense infection of the lower tract with pus free sterile urine from each kidney.

The shortness of the infant female urethra (from 0.8 to 1.5 cm. in length), bathed in feces and intimately connected with the kidney through subtrigonal and ureteral lymphatics, explains the marked disproportion of acute urinary infections in girl and boy babies, 5 to 1. In our series of chronic urinary infections this ratio is 3 to 1 (girls, 216, boys, 59). This I interpret as indicating (1) that many cases of so-called pyelitis in girls are in truth acute urethrotrigonitis or urethrocystitis and (2) that with free vesical drainage the lesion in the female usually heals promptly. In half of our cases of chronic pyuria in boys, vesical outlet or urethral obstruction existed; in girls, obstruction of the upper tract was more often found. Unquestionably renal infection by vesico-ureteral reflux (urogenous route) occurs in some instances.

TABLE 1.—*Age of Patients*

Under 3 months	11
3 to 6 months	12
7 to 12 months	32
13 to 36 months	60
4 to 6 years	64
7 to 10 years	75
11 to 15 years	20
	274

TABLE 2.—*Organisms Isolated from the Urine in This Series*

Bacillus coli		116
"Staphylococci"	59	
S. albus	19	
S. aureus	7	
hemolyticus	3	88
"Streptococci"	9	
hemolyticus	10	
nonhemolytic	7	
viridans	6	32
Typhoid bacillus		10
B. intermediate		8
Tubercle bacillus		5
Gram positive bacillus		7
Enterococcus		3
Dysentery bacillus (Flexner)		2
Micrococcus tetragenus		1
Bacillus aerogenes-capsulatus		1
Mixed infection		53
Sterile		34
Not recorded		19

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Once established, urinary infection is maintained chiefly by stasis or, as von Lichtenberg calls it, urinary constipation. Stasis is usually due to obstruction but may result from neuromuscular disease of the urinary channels. In juveniles, most urinary obstruction is due to congenital anomalies. Ureteral obstructions are most common; in a series of 2,420 pediatric autopsies at Bellevue Hospital we found 49 cases of ureteral blockage, an incidence of nearly 2 per cent. Congenital ureteral stricture occurred in half of the forty-nine. Aberrant renal polar vessels, kinks, calculi, periureteral inflammations or masses may also obstruct the ureter. Congenital contracture of the bladder outlet, posterior urethral valves or urethral stricture, especially stricture at the meatus, are the commonest forms of infravesical blockage. Neuromuscular disease causes stasis when chronic vesical sphincterospasm exists or when by neurogenic atonic dilatation the urinary tract becomes a flabby reservoir.

As long as conditions producing stasis persist the hope of cure of the infection is small.

Foci of infection and constipation also help to perpetuate urinary infection; the first by continually refreshing the bacterial attack on the kidney, the second by increasing the renal toxic excretory load. Recognition of these various etiologic elements indicates some of the lines of therapeutic attack.

PATHOLOGY

When chronic pyuria is due to persistent renal infection, as it most often is, chronic interstitial focal suppurative nephritis is the usual kidney lesion. Areas of inflammation and infection (leukocytic infiltration, bacteria, necrosis or sclerosis) are found in the interstitial tissue between the collecting tubules, either diffusely scattered throughout the organ or localized. The location of these lesions indicates bacterial arrival by the blood stream (intertubular arterioles) or by the intrarenal lymphatics joining the pelvic and perirenal plexuses. The degree of tubular epithelial damage is variable. As a rule, the parenchymal changes are marked, those of the pelvis meager. Therefore, while the diagnosis of pyelitis is clinically convenient to employ in these cases, on a pathologic basis pyelonephritis is the correct term.

If obstruction complicates the anatomic picture, hydro-ureter, hydronephrosis, dilatation of the collecting tubules with compression atrophy and sclerotic destruction of the parenchyma are usually found. These kidneys are quite uniformly riddled with focal suppuration.

SYMPTOMS

Often the symptoms of chronic urinary infection in children are so meager that the disease is disclosed only by cursory urinalysis, possibly while the patient is being examined for another condition remote from the urinary tract. The symptoms alone seldom suffice to permit the correct diagnosis; in general, these children present the picture of toxemic retardation. The symptoms may be grouped into (1) those referable to the urinary tract and (2) general. Pyuria, frequency, dysuria, urgency, sometimes hematuria, and vesical, loin or renal pain are the most common complaints. In a few instances only pyuria is noted. Some patients complained of "enuresis"—urinary incontinence due to associated inflammation of the vesical outlet.

Of the general systemic symptoms, gastro-intestinal disturbances are outstanding and occur in fully 50 per cent of the advanced cases. Loss of or failure to gain weight, anorexia, indigestion, "biliousness," constipation, flatulence, nausea or even vomiting may misdirect attention to the alimentary tract. Frequently these children are treated months or years for "stomach trouble." A low grade fever is not uncommon; when fever of unexplained origin exists in a child, the urine should be examined most carefully. Anemia is usually manifested by a pale and pasty complexion; the combination of this appearance and the results of examining the urine sometimes leads to the diagnosis of chronic interstitial nephritis.

Neurologic symptoms are directly due to toxemia and to loss of renal function. Headache, apathy, irritability or nervousness is commonly complained of; uremic stupor is a terminal manifestation and rare.

DIAGNOSIS

Careful history taking from the parent will usually yield a diagnostic clue (vesical discomfort, frequency and the like) but occasionally the infection is disclosed only by a routine urinalysis. A thorough physical examination is imperative; inspection of the oral cavity may reveal focal infection in the tonsils or in a dental abscess. "Chronic pyelitis" may be caseous renal tuberculosis, secondary to a pulmonary lesion. Occasionally a cardiovascular examination discloses a high blood pressure secondary to advance renal destruction. By abdominal palpation one may find renal or vesical enlargement or tenderness or pain over the course of the ureter. The male external genitalia must be palpated; in girls the "chronic pyelitis" has often been found to be simply pyuria secondary to a profusely discharging persistent vaginitis.

Urinalysis, especially for pus, blood and bacteria, is the foundation of all urologic investigations. In girls, only catheterized specimens are worthy of examination. In boys, retraction of the prepuce with careful washing of the glans penis and meatus and collection of the voided specimen only after a few cubic centimeters has been passed is a satisfactory method. If these precautions are not observed, vaginal or preputial débris render the laboratory report dangerously misleading, especially if smegma bacilli are interpreted as tubercle bacilli. If repeated urinalyses show pyuria (more than 5 or 6 clumped or nonclumped white blood cells per low power field in the freshly voided unsedimented specimen) and culture or smear reveals bacteria, a complete urologic examination should be seriously considered.

In my opinion, when pyuria persists longer than one month despite intensive medical therapy, a urologic examination is indicated. By intensive therapy is meant the eradication of focal infections as far as possible, the promotion of adequate intestinal elimination, nutritional betterment and the liberal administration of so-called urinary antiseptics. While the newer drugs (caprokol, pyridium, acriflavine base) have staunch advocates, methenamine in large doses together with the requisite urinary acidulant has given the best results in my experience. These results are not consistently satisfactory. While there are children with an iodiosyncrasy for methenamine, as a rule it may be given in doses whose basis of computation is 12½ grains (0.8 Gm.) daily per annum. For example, a 2 year old child receives 25 grains (1.6 Gm.) a day. Seventy-five grains (5 Gm.) a day is the average maximum that my associates and I employ in children, although we have administered still larger doses without untoward effects. A sufficient urinary acidulant is given to keep the urine acid to litmus. As a rule, from 10 to 15 grains (0.65

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to 1 Gm.) of ammonium chloride or from 40 to 60 grains (2.6 to 4 Gm.) of acid sodium phosphate daily suffices. Methenamine and the acidulant are given for from four to six days; a rest period of two to four days is given and the drugs are repeated. Intolerant to the larger doses, these patients frequently do very well on doses of from 10 to 15 grains daily less. In a few instances, bacteriologic cure will be obtained (two sterile cultures).

TABLE 3.—*Results in Roentgen Examination* *

Normal	63
Spina bifida	21
Sacral spinal deformity	1
Cystogram normal	176
Cystogram abnormal	55
Ureteral reflux	33
Kidney stone	1
Ureter stone	2
Bladder stone	3
Urethral stone	1
Urethrogram abnormal	4
Tuberculous mesenteric glands	2
Not recorded	23

* Plain roentgenography as well as cystography should be performed as a routine during urologic investigation for persistent pyuria in children.

Having failed medically to cure the chronic infection, one next proceeds to carry out a complete urologic examination. Certain precystoscopic data are obtained: chemical examination of the blood (nonprotein nitrogen or blood urea nitrogen, and carbon dioxide); the two hour phenolsulphonphthalein output; a plain roentgenogram of the urinary tract for calculus shadows or spinal defects—notably spina bifida. A cystogram is made to demonstrate the vesical outline, ureteral reflux or a filling of the posterior urethra (as one finds with congenital valvular obstruction of the posterior urethra). Occasionally the cystographic data render cystoscopy unnecessary. During the past year we have used an iopax derivative and skiodan for precystoscopic intravenous urography in a great many instances but our results in young children have been only moderately satisfactory (table 3).

With the data from these procedures at hand, cystoscopy is carried out. General anesthesia is required in approximately one half of all cases, regularly so in girls under 5 years and boys under 7 or 8. Irrespective of the child's age, unusual irritability or the causation of pain demands a general anesthetic; without it, instrumentation is not only unsatisfactory but dangerous. Local urethral anesthesia suffices in a fair number of cases. More recently, we have been successfully employing caudal anesthesia in boys over 4 years of age.

After the bladder and the posterior urethra have been inspected, the ureters are catheterized, specimens collected and divided renal function tests performed. While phenolsulphonphthalein is the dye used almost universally for the latter purpose, we employ indigo carmine intravenously as a routine. When indicated, a pyelogram is made. Although aware of its dangers, we frequently perform bilateral pyelography, using a 20 per cent solution of an iopax derivative as the medium for retrograde injection. Not only is this substance less irritating than the customarily employed sodium iodide (less pain and pelvo-ureteral spasm), but better urographic outlines are obtained. The great variety of urologic lesions found by complete urologic examination to be the cause of or etiologically associated with chronic pyuria included almost every known disease of the urinary tract.

In common with urologist colleagues, militant antagonism to urologic examination is quite regularly encountered in pediatricians and other practitioners caring for juveniles with chronic infections of the urinary tract. Fear of postcystoscopic morbidity or even mortality is the dominant objection. To determine the average risk, I studied the febrile reaction following 461 complete urologic examinations. The results are shown in table 4. Comparative evaluation of the pathologic observations and the minimal examination risk involved affords little ground for argument against complete urologic examination in these young patients. Moreover, compared with the incidence and severity of postcystoscopic morbidity in 300 consecutive examinations in adults at Bellevue Hospital, that in children is slightly less than half.

TREATMENT

Medical therapy in chronic pyuria has been briefly outlined. In a few cases, urinary sterilization will be achieved; in many, the infection can be controlled. To me, failure to cure the infection by these methods in one month indicates a complete urologic examination.

Surgical treatment may be subdivided into instrumental and operative.

Instrumental Treatment: In this group I include such procedures as urethral dilation, electrotome destruction of posterior urethral valves or electrotome resection of the contracted bladder outlet, litholapaxy, ureteral dilation and pelvic lavage. I rarely employ pelvic lavage because I feel, from experience, that the beneficial results ascribed to pelvic washing are in truth derived from the ureteral dilation coincident to ureteral catheterization.

The elimination of urinary stasis by these mechanical measures plus the liberal administration of urinary antiseptics may be expected to cure a certain number of chronic infections of the urinary tract. In my hands they have.

TABLE 4.—*Postcystoscopic Febrile Reactions* *

Cystoscopic Reactions						
Less than 100 F.	100	101	102	103	104	105
Days †						
1	12	28	11	4	4	.. ..
2	2	7	6	3	1	.. ..
3	..	3	..	..	1	1 ..
4	..	1	..	1	1	1 ..
5	..	..	..	..	..	.. ..
6	..	..	..	1	1	.. ..
7	..	..	..	..	..	.. ..
8	..	1	..	..	..	.. ..

Total reactions	91
Examinations	461
Reaction incidence	19.5%
Temperature of 100 F.—48 hours	50
Total of true reactions	41
True reaction incidence	8.8%

* It is noteworthy that only one in five suffered any rise of temperature; in one in eleven, a temperature above 100 F. required longer than two days to become normal again. Febrile reactions were of much greater incidence when general anesthesia was used. Often in children prepared for cystoscopy but in whom the examination was postponed, a moderate evening temperature (101) was noted.

† Days following cystoscopy before temperature again became normal.

Operative Treatment: The character of the more commonly indicated surgical procedures is shown in table 5. Relief of obstruction and the eradication of urinary stasis, sometimes extirpation of a chronic suppurating organ or the establishment of free drainage of the upper tract by shunting out the lower tract (cystotomy), are typical of the operative procedures required

—fundamentally the institution of free drainage. In our patients the operations performed ranged from simple meatotomy to the more complex ureteroheminephrectomy (renal resection). It is of note that these young patients withstand urologic investigation and major urologic surgery better than do adults. Children have, if I may use the term, greater constitutional resilience.

The therapeutic results obtained in this series follow briefly: Two successive negative urine cultures was the test of cure. Of the 274 patients, 45 (18 per cent) were cured; 130 (52.2 per cent) were improved; 23 (9.2 per cent) were unimproved; 18 were lost; 15 left the hospital against advice; 15 were transferred to another hospital for contagion and like reasons, and 28 (11.2 per cent) died. Fifteen deaths were due to urinary disease; thirteen resulted from other causes, such as pneumonia, exanthems and typhoid. The gravity of the lesions causing chronic pyuria is suggested by the relatively low incidence of cure and the relatively high mortality rate.

TABLE 5.—*Character of Treatment Employed in this Series of Two Hundred and Seventy-Four Cases**

Treatment			
None or medical	142	Cystotomy for permanent drainage	3
Ureteral dilation	15	Cystotomy for temporary drainage	4
Ureteral dilation with lavage	13	Fulguration of ureterocele	2
Indwelling ureteral catheter	2	Meatotomy	13
Bilateral ureteral meatotomy (suprapubic route)	4	High voltage roentgen therapy	3
Nephrectomy	16	To tuberculosis sanatorium	4
Nephrostomy	2	Corset for nephroptosis	1
Ureteroheminephrectomy	1	Dilation of bladder outlet	9
Ureteronephrectomy	3	Urethral dilation for stricture	6
Bilateral decapsulation	1	Resection of bladder outlet for "cord bladder"	1
Bilateral ureterostomy	2	Punch operation for "cord bladder" outlet obstruction	1
Bilateral resection of ureters	1	Electrotome excision of bladder neck contracture	5
Resection of aberrant vessel	2	Incision and drainage of perinephric abscess	2
Resection of trigon	1		
Ureteropelvoplasty	2		
Diverticulectomy	1		
Electrotome excision of urethral valves	7		
Indwelling urethral catheter	5		

* As a rule, the greater the duration of the pyuria, the greater the likelihood that surgical treatment will be required.

SUMMARY

Under the diagnosis of chronic pyelitis or chronic cystitis, infants and children are commonly and unsuccessfully treated for months or years. When renal infection exists, the lesion is basically suppurative pyelonephritis. In many cases of "pyelitis," the infection is localized to the bladder and urethra. When chronic urinary infection resists intensive medical treatment for one month, a complete urologic examination is indicated. Only by this method can the correct diagnosis be established. As shown in the tables, I have found in infants and children almost every lesion of the urinary tract which one is accustomed to associate with adult life. As a rule, medical therapy alone is inadequate to effect a bacteriologic cure and, while surgical attack may serve only to control rather than to cure the infection, conservative operations will often prevent further renal destruction and thus prove life saving. Occasionally, nephrectomy is demanded. While urology in children is yet a virgin field, the striking accomplishments of its many workers actively challenge the almost universal resistance of practitioners in general and pediatricians in particular to the employment of recognized urologic methods of diagnosis and treatment when the patient is a child.

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THE UNSTABLE COLON AND NEUROSIS

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The confusion which exists at present in the minds of most physicians in regard to the term irritable or unstable colon and its relationship to neurosis justifies a study such as this, which attempts to clarify the meaning of the term and to indicate its exact relationship to neurosis. Conditions described by the terms "spastic colitis," "intestinal neurosis," "nervous diarrhea," "constipation," "mucous colitis" and "dilatation of colon, cause unknown," in recent years have been placed by some gastro-enterologists in the more suitably designated and more comprehensive category of the "irritable or unstable" colon. The term "unstable," first suggested by Kantor, replaces "irritable," because in some phases of the condition decreased irritability rather than increased irritability is found. The fundamental factor in the condition is an imbalance between the nervous and the muscular apparatus of the colon, which results in a disturbance in its mechanical, and, to a lesser degree, its secretory functions, an imbalance that comes to the consciousness of the individual by various symptoms, chief among which are abdominal discomfort or pain, gaseous distress and an abnormal elimination of fecal material.

The diagnosis of unstable colon, like that of many functional conditions, is made only after organic disease has been eliminated. The chief symptoms of the condition, namely, abdominal discomfort, gaseous distention and disturbance of elimination, are found so frequently in organic lesions of the colon, in disease of the gallbladder and in gastric and duodenal ulcer that all diagnostic measures to rule out these organic conditions must be used before it can be stated that the condition is functional. The term "unstable" is applied to the colon rather than to the entire alimentary tube, probably because dysfunction of the colon is more obvious to the examining eye and hand than that of the small intestine and of the stomach, though pylorospasm is often noted in association with it.

The diagnostic criteria are as follows: A history of one or more of the following symptoms: dysfunction resulting in either constipation or diarrhea, abdominal discomfort or pain, which may be shifting or localized, gaseous distention and eructations, nausea, vomiting and loss of appetite and weight. In addition to these gastro-intestinal symptoms, there are not infrequently found (62 per cent in our series) symptoms of neurogenic origin, such as nervousness, easy fatigability, palpitation, precordial pain, headaches, depression, vertigo and tinnitus.

Physical examination frequently reveals tenderness in one part of the colon or over its whole course, and sometimes a tightly contracted, ropelike sigmoid or a dilated cecum is felt by the palpating hand. Chemical analysis of the gastric contents shows probably not an abnormal percentage of cases of achlorhydria or hyperchlorhydria, and chemical examination of the stools does not reveal abnormal contents. The extent of dehydration of the stools is so frequently determined by the use of cathartics, previous to examination, that no reliable data are obtained in this matter, though watery

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stools without catharsis are found in 9 per cent of the cases. In some cases, an excess of mucus, the so-called mucous colitis, is found.

Roentgenologic examination is helpful in 75 per cent of the cases by revealing with the opaque enema and a standard technic the following deviations from normal: increase in length, increase or decrease in caliber, absent or increased haustrations, too rapid or too slow rate of filling, absence of sensation or severe distress with filling and too slow or too rapid emptying.

The treatment of the unstable colon is directed toward an improvement in its mechanical function, and consists of an attempt to restore the colon to normal tone or stability by rest, this form of treatment being effective whether the colon is hypertonic or hypotonic. Rest is accomplished by rest in bed in some cases, in all cases, by a bland diet of low residue gradually increased, by heat and by atropine.

The nature of the condition, a disturbance in the neuromuscular mechanism, makes it possible for the cause to be local in the bowel or to be of psychic control, and it is this fact which has caused difference of opinion and confusion in regard to the relationship of the condition to neurosis. It must be granted that local irritation of colonic muscle, as from catharsis, irritating enemas and the use of too much roughage in the diet, can result in dysfunction. Experimental evidence confirms clinical observations to prove this fact. It is interesting to note that in the series of cases studied 73 per cent give a history of the daily or frequent use of laxatives, enemas and colonic irrigations. It is of further interest that the omission of all measures to induce muscular contraction in the colon and the return to normal function is the sine qua non of therapy. From these two facts it seems fair to deduce that this condition of unstable colon can be due to a specific irritation of the neuromuscular apparatus of the colon, without the involvement of the nervous system as a whole. In our series of cases, 38 per cent of the patients gave no history of symptoms of neurogenic origin, and a patient in this group can therefore be regarded as having an unstable colon because of local irritation, which, from the history of the use of laxatives and the relief obtained with the omission of all measures to produce abnormal colonic contraction, may justly be ascribed to catharsis. The outstanding symptoms in this group were "constipation," which, in the majority of cases, undoubtedly signified simply "cathartic habit," abdominal distress varying from mild discomfort to colicky pain, gas, both distention and eructations, nausea and vomiting and frequently loss of appetite and malnutrition. Malnutrition was found three and one half times as frequently as was obesity, usually because the occurrence of pain and gas led these patients to sitophobia by the elimination of one food after another in order to prevent discomfort. Rest to the colon, so that the neuromuscular apparatus again functions normally, and the resultant knowledge by the patient that artificial aid is unnecessary for bowel function are the two important factors in recovery.

The occurrence of associated symptoms of neurogenic origin, varying from easy fatigability and vertigo to headaches, nervousness and depression, was found in 62 per cent of our series. This group was studied from the point of view of determining whether the abdominal symptoms, which did not differ from those found in the first group of cases, were merely a part of a general neurosis, in other words, secondary to a centrally neurogenic cause, whether the abdominal condition might be, at least in some cases, the precipitating cause of the associated neurogenic symptoms, or whether the two conditions existed independent of each other. In contacts with these patients the impression is constantly received that in certain cases the disturbed physiologic condition of the colon is the starting point of trouble, a factor quite unrecognized in the treatment of the neurosis; in others it seems to be only the most tangible part of the evidence of neurosis, possibly the symptom most likely to attract the attention of the physician, and in a third group, one condition seems to be superimposed on the other without a definite cause and effect relationship.

The determination of what is cause and what is effect is always an alluring problem in medicine, but an elusive one in those fields in which a specific chemical or bacterial cause is not in question and in which the relief of symptoms is determined by subjective evidence.

TABLE 1.—*One Thousand Cases of Unstable Colon*

Sex and Age Incidence; Symptoms; Colon Findings (Roentgenologic)

Male 22%
Female 77%

Age in Years	Per Cent	Age in Years	Per Cent
Under 20	6	50 to 59	17.0
20 to 29	19	60 to 69	7.3
30 to 39	26	70 and over	6.7
40 to 49	24		

"Constipation" (use of laxatives) in ..... 80 per cent of cases
Cathartic or enema habit in ..... 73 per cent of cases
Diarrhea (constant or alternating with constipation) in 9 per cent of cases

	Per Cent		Per Cent
Distention	80	Shifting abdominal distress	20
Eructations	59	Epigastric	9
Nausea	23	Lower abdominal region	7
Vomiting	18	Upper abdominal region	5
Malnutrition	15	Right lower quadrant	7
Loss of appetite	13	Left lower quadrant	4
		Left upper quadrant	4
		Right upper quadrant	4

Associated Neurogenic Symptoms	Per Cent
Nervousness and easy fatigability	36
Headaches	48
Vertigo	31
Palpitation	10
Depression	8
Tinnitus	6

Chemical Findings	Per Cent of Cases	Roentgenographic Findings	Per Cent of Cases
Achlorhydria	10	Distress with filling	15
Hypochlorhydria	14	Rate of filling increased	20
Normal hydrochloride	45	Rate of filling decreased	5
Hyperchlorhydria	14	Redundancy	26
Not determined	17	Hypertonicity	27
		Hypotonicity	30
		Combined hypotonicity and hypertonicity	7

When relief of certain symptoms follows the use of certain procedures, it is natural to assume that these procedures effected the relief. In the matter of the relief of symptoms such as those found in association with the unstable colon, one must be guided in large part by the patients' reports of subjective states. To be sure, there are certain objective findings, such as the character and frequency of stools, the increase in weight and obvious improvement in appearance of the previously malnourished patient and the roentgenographic evidence, in many cases, of the return of normal tone to the colon. But the improvement in subjective symptoms must be gaged by the report of the patient that he has no distress, that he is less nervous, that he has no headaches, that he feels less easily fatigued and more cheerful and that dizziness and palpitation have subsided. Certain analytic readers, especially when they recall the vagaries of neurotic patients in their search for health, will undoubtedly dispute the contention of this study that in a certain

number of cases treatment of the colon has brought about improvement in neurogenic symptoms; but it is my intention to present the data as they are found in the records of these patients, and then to discuss the reasons why, in my opinion at least, certain conclusions may be regarded as reasonable.

Table 1 shows the sex and age incidence, the symptoms and the chemical and roentgenologic findings in this group of 1,000 cases of unstable colon, which have been treated and followed for periods varying from two months to seven years.

Table 2 shows a comparison of certain of these data in the two groups of patients, those without neurogenic symptoms and those with neurogenic symptoms. Here it is of interest to note the similarity of sex incidence and the difference in age incidence, the younger patients showing a markedly diminished tendency to associated

TABLE 2.—*Comparison of Data in Two Groups of Cases of Unstable Colon*

	Group 1 (Those Without Neurogenic Symptoms) 38 per Cent of Total Group Per Cent	Group 2 (Those With Neurogenic Symptoms) 62 per Cent of Total Group Per Cent
Male	29	37
Female	71	63
Under 20 years	17*	4*
20 to 29 years	19*	10*
30 to 39 years	29	20
40 to 49 years	18*	30*
50 to 59 years	11	20
60 to 69 years	6	6

	Group 1, per Cent	Group 2, per Cent
Constipation	84	84
Diarrhea	13	5
Distention	69*	84*
Eructations	63	64
Loss of appetite	2*	8* (sitophobia 5%)
Malnutrition	7*	20*
Obesity	2	1.5
Nausea	18*	24*
Vomiting	13*	24*
Abdominal distress	90	87
Hypotonicity of colon	59	62
Hypertonicity of colon	33	35
Achlorhydria	2*	17*
Hypochlorhydria	22	16
Normal hydrochloric acid	50	50
Hyperchlorhydria	14	11
Improvement of abdominal symptoms	94 (5% recurrences recorded)	91 (5% recurrences recorded)
Improvement of neurogenic symptoms		75 (8% recurrences recorded)

Star indicates data in which there is marked difference in incidence between the two groups.

neurogenic symptoms as compared with those in the fourth and fifth decades.

The following deductions which confirm clinical impressions have been made from this study: 1. There is a group of patients who have gastro-intestinal symptoms due to a functional disorder in the colon, caused by specific irritation and not dependent on a centrally neurogenic cause. 2. This irritation is usually due to the use of cathartics and enemas. 3. There is another group of patients with the dysfunction of unstable colon who have associated neurogenic symptoms. Since the treatment of these two groups of patients has been the same, except for the nonspecific and casual psychotherapy consequent on the association of physician and patient, and since there is a definite percentage of patients in this second group who show clearcut improvement in their neurogenic symptoms, it is assumed that the condition of colonic dysfunction may precipitate in a fatigued patient symptoms of neurosis, and that when the normal physiologic condition is restored, the associated symptoms are relieved. Finally, it is shown that there is a small group of patients suffering from both neurosis and unstable colon in whom the relief of the latter condition improves the general condition of the patient but does not affect the neurosis.

ABSTRACT OF DISCUSSION

DR. JOHN G. MATEER, Detroit: Clinical experience indicates that there is a local factor of disturbed function of the colon which exists apart from the influence of the central nervous system. Improper diet, cathartics and enemas are important factors in maintaining this colonic instability, and the removal of these factors is essential for successful treatment. Local treatment only of the disturbed function of the colon has often been effective in clearing up the symptoms. In moderately severe and marked cases, functional colon distress is often aggravated by nervous upsets, external stimulants, faulty nervous habits or overwork and frequently is relieved by the elimination or reduction of these various neurogenic factors. The degree of general nervous tension present seems to be one important underlying factor in determining the tendency to instability of the colon. In a selected group of patients whose local symptoms had persisted in spite of proper diet, physiologic regulation of the bowels and elimination of neurogenic factors, stool vaccine therapy was instituted as the only new therapeutic measure. Vaccines to which these patients were markedly skin sensitive were used. In a high percentage of this group of obstinate cases, the colon symptoms, and also the frequently associated chronic headache and vertigo, have either disappeared or been definitely improved. I would emphasize that the treatment of the unstable colon is not a stereotyped procedure but one requiring in the individual case an evaluation of the several etiologic factors, and a program of therapy comprehensive enough to eliminate these factors.

DR. JULIUS FRIEDENWALD, Baltimore: Since mucous colitis was first recognized, a neurogenic factor has been conceded and the mucous discharge has been considered as a nervous hypersecretion. This condition may continue indefinitely with exacerbations and remissions associated with spasticity of the colon, from which recovery may occur or, as the result of a lowered resistance of the bowel, infection may follow with the production of inflammatory changes and ulcerative colitis. In the etiology of the unstable colon, the original neurogenic factor must be borne in mind. The patient shows signs of "neurasthenia," which have usually existed prior to the development of the intestinal symptoms. "Vagotonia," as commonly observed in the neurasthenic, the hysterical and hypochondriac patients, plays an important rôle in this respect. In the patients that I have observed, marked emotional instability was present in many instances; about one half were depressed or hypochondriac. Nervous exhaustion is common, and this frequently bears a relation to the degree of production of mucus. Cancerophobias are prevalent. The constitutional and hereditary factor from an etiologic standpoint has not been sufficiently emphasized. There is a correlation between asthenia and the secretory and motor disturbances noted in the unstable colon. Here is a predisposition to the production of a dysfunction in an area of least resistance, a predisposition gradually accentuated by prolonged nervous strains and emotions, intensified by abdominal operative procedures, abuse of tobacco and alcohol, pregnancy, the menopause, and even menstruation. Both psychiatric treatment and treatment directed to the bowel should be carried out at the same time.

DR. HENRY A. RAFSKY, New York: In treating the patient with an unstable colon, one is treating an individual who has an underlying imbalance of the vegetative nervous system. Other factors must be taken into account in addition to those mentioned by Dr. Jordan. These are allergy, intercurrent infections and the patient's psychic reaction to mental strain. In regard to vaccine therapy, unless an organism is obtained in pure culture, it is questionable whether the results are due to specificity or to the nonspecific protein properties in the vaccine. I think it is the latter. Working on this basis and applying Mueller's spasmophilic theory in peptic ulcer, I have prescribed nonspecific therapy for a number of patients with unstable colons. The results were very gratifying in all but

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the patient with a low blood cholesterol. This puzzled me until Drs. Leopold and Bernhard of the Lenox Hill Hospital discovered that they could increase the blood lipoids in children by treating them with ultraviolet irradiation and inunctions of wool fat. I applied this method to the patients with an unstable colon and low blood cholesterol. In many cases, as the blood cholesterol rose, the clinical symptoms improved. Clinical improvement may take place in a few weeks in a patient with an unstable colon, but it takes at least six months before there is definite roentgenographic evidence of improvement.

DR. SIDNEY SIMON, New Orleans: The so-called unstable colon has been overlooked, undiagnosed and to a great extent mistreated. Many of these patients have undergone unnecessary surgical procedures. I am not willing to accept the idea that the unstable colon is a purely neurogenic condition and I am as unwilling to accept a neurogenic foundation for this condition as I would be to believe that a pylorospasm, a cardiospasm or any other type of spasmophilia of the intestinal tract might be based on a purely neurogenic origin. I believe that the factors of disturbed digestion of the upper tract, mechanical factors encountered along the entire intestinal canal, such as a proctoptosis, adhesions, bands, the purely mechanical side of obstruction or partial obstruction of the large bowel or even of the small bowel, as well as disturbances of endocrine function, allergic reaction, food factors, and many other factors, are probably closely and intimately interwoven with this condition that is called the unstable colon; therefore I believe that the purely neurogenic factor should be held strictly in abeyance until a thorough critical analysis of the case from the standpoint of other possible organic sources has been made.

DR. SEALE HARRIS, Birmingham, Ala.: There has been so much discussion of the irritable colon that sometimes the fact has been lost sight of that there may be actual pathologic changes in the colon which may account for many of the symptoms complained of by the psychoneurasthenic. I try to make a thorough study of the food habits of my patients not only as to the actual amounts of food ingested but also as to its vitamin content. I have come to the conclusion that a high carbohydrate diet and a diet deficient in vitamins is responsible for some of the colon troubles. In feeding monkeys with autoclaved rice, McCarrison found as the first result constipation and intestinal stasis, then colitis and later diarrhea. The control monkeys fed on a diet well balanced and rich in vitamins remained normal. He could not infect the control monkeys with Endamoeba histolytica, whereas those fed on high carbohydrate diets could be infected at will. In other words, McCarrison has proved that a diet deficient in vitamins predisposes to infection of the colon. I believe there is an actual colitis to be dealt with in many cases of unstable or irritable colon associated with nervous instability. In treating a patient in whom the neurogenic element is pronounced, I think it is unfortunate to discuss the subject of the colon with him except to reassure him that he can be relieved. People are getting to be colon minded. The patients who have learned the term irritable colon are difficult to deal with. While assuring them that the colon is being looked after, one should look after the health of the whole patient. Proper exercise at the proper time is important, usually rest first, and a diet largely of fruits, vegetables and milk. I think that the smooth diet has been overworked more than anything I know of in the colon troubles, and bran should be avoided. For years I have been doing routine fasting blood sugars in these cases and have found a number with varying degrees of hypoglycemia. Frequent feedings of a low carbohydrate, high fat diet has been helpful in cases of psychoneurasthenia with colon manifestations associated with hypoglycemia.

DR. SIDNEY A. PORTIS, Chicago: I have never been convinced that the function of the colon could be studied with the barium enema. I think it is unphysiologic and that it is much better to follow the normal passage of the barium downward and see what deviations from normal may be present. I am convinced that the colon is not so much the source of trouble in gastro-intestinal conditions as is the dysfunction of the upper intestinal digestion. Unfortunately, too little is known from the standpoint of clinical medicine about the dysfunction of upper intestinal digestion. No exacting methods of determining especially disturbances of pancreatic dysfunction are available; when more accurate knowledge is obtained of what goes on in the upper intestinal tract, the knowledge of colon disturbances will be better classified. Many of these so-called functional disturbances of the colon may be only a factor in avitaminosis, which is playing an important rôle. Even the more enlightened public suffers from avitaminosis. Too many disturbances of the colon are relegated to those of neurogenic origin. Little experimental evidence has been produced to support this point of view, and I am sure that the conclusions one draws are purely theoretical. It seems to me that a more practical basis of classifying dysfunction of the colon should be obtained and the word "colitis" deleted from medical literature unless there exists an actual organic involvement of the large bowel.

DR. SARA M. JORDAN, Boston: Dr. Mateer has emphasized the fact that no stereotyped procedure is of any value, but that the patient must have treatment adapted to him as an individual. Dr. Friedenwald has mentioned the constitutional factor which he has always so properly emphasized as being important. The matter of allergy which Dr. Rafsky brought up is valuable. I have recently followed this point carefully with tests to determine whether or not these patients have allergic manifestations; in some of the earlier cases I found that patients who had hives were relieved of their hives after they had treatment, and I feel certain I had eliminated some food which was causing trouble without realizing that the trouble was due to an allergic manifestation. Dr. Portis stressed the fact that the upper digestive tract is disturbed in these cases, and Dr. Simon also emphasized that. The barium enema method is unphysiologic, to be sure. A point I wanted to bring out was that any enema is unphysiologic but that a normal standard for this procedure can be established, even though it is unphysiologic, and that these standards of normal are useful in diagnosis. Dr. Harris mentioned that these patients become colon conscious. It is the aim of this treatment to make the patient colon unconscious.

UROLOGIC BACKACHE

HAROLD L. MORRIS, M.D.
LEO J. LANGLOIS, M.D.
AND
JAMES F. BRUNTON, M.D.
DETROIT

Backache is one of the common symptoms complained of by many patients seeking advice concerning their disabilities. In some instances it assumes the paramount infirmity, particularly in men. In women, this complaint is borne with greater fortitude; they apparently consider that the dull aching variety of backache is a necessary evil, to which they must submit throughout life and the presence of which is admitted only after interrogation.

In the recent literature the gynecologists have considered the question of backache from the point of view of that specialty. Sturmdorf [1] described gynecopathic myospastic backache in women, and that associated with retroversion. Ward,[2] quoting statistical data in his series, stated that 85 per cent of the cases were due to pelvic disease and 15 per cent to orthopedic or nonsurgical conditions. Bullard [3] admitted that in fifteen of every hundred patients operated on, the backache persisted after otherwise successful correction of gynecopathic conditions.

The majority of cases of backache seem to fall into three main groups: gynecopathic, orthopedic and urologic. The literature is replete with articles considering

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1. Sturmdorf, A.: Surg., Gynec. & Obst. **53**: 209 (Aug.) 1931.
2. Ward, G. G.: Am. J. Surg. **2**: 257 (March) 1927.
3. Bullard, E. A.: Am. J. Obst. & Gynec. **1**: 717 (April) 1921.

the symptom from the point of view of the gynecopathic and orthopedic specialties. Some months ago we began a survey of our cases with a view to a consideration of this symptom from the urologic point of view, and to determine if there are any essential differences between the types of backache described by others and that found among patients suffering with genito-urinary conditions. This survey covered over 3,600 cases, comprising almost every type of urologic condition. We have taken care not to include any cases in which orthopedic or gynecopathic conditions might be suspected. Of that number, 1,129, or 31 per cent, gave, as one of their complaints, backache. In this series 507 were males and 620 females.

It has been our experience that in the subjective inquiry concerning a patient's condition the symptom of backache is inadequately considered. The consideration of its differential value in the history is entirely overlooked in the majority of cases. Usually a plain statement to the effect that the patient has had "backache for months" is deemed sufficient and is never amplified further.

In order that this symptom might be of value in differential diagnosis the following data should be reviewed during the taking of the history:

1. Duration.
2. Post-traumatic or postsurgical.
3. Nature:
   (*a*) Sharp or dull.
   (*b*) Constant or intermittent.
   (*c*) Localized or diffuse.
   (*d*) Referred.
   (*e*) Deep-seated or felt on the surface.
   (*f*) Sharply located (as pointed out by the patient).
4. Location.
   (*a*) Lumbar.
   (*b*) Sacral.
   (*c*) Lumbodorsal.
   (*d*) Costovertebral.
   (*e*) Unilateral or bilateral.
5. Time of occurrence.
   (*a*) In the morning on arising.
   (*b*) Late in the day.
6. Influenced by:
   (*a*) Change of posture.
   (*b*) Manipulation of the leg.
   (*c*) Rest in recumbent or sitting position.
   (*d*) Straining.
   (*e*) Stooping.
   (*f*) Locomotion or exertion.
   (*g*) Coughing.
   (*h*) Defecation.
   (*i*) Micturition.
   (*j*) Menstruation.
   (*k*) Constipation.

We do not attempt to state that this symptom alone can be of any value in arriving at a diagnosis, but its proper interpretation associated with other symptoms may often give a clue as to the proper method of further investigation. The question as to its location, severity and radiation can always be confirmed on physical examination.

BACKACHE OF RENAL ORIGIN

As a result of our review we find that the majority of patients with chronic renal lesions refer to their disability in the dorsal region as a backache, and not commonly as a back pain.

To understand the causative mechanism of renal backache, it should be borne in mind that the kidney, as referred to clinically, is made up of a solid parenchymatous structure—the kidney substance—and a hollow cavity consisting of pelvis and calices. It is surrounded by a capsule, and in many persons the kidney may leave the normal bed while they are in the erect posture. Involvement of the structures of the kidney, the kidney capsule or pericapsular tissues by inflammatory processes, distention of the capsule or lack of maintenance of the kidney in its normal position are all conducive to backache at some time during the course of the disability.

In a series of 374 cases of chronic pyelitis we found that the complaint of backache was seldom referred to the costovertebral region. Only an isolated patient described any radiation of the ache. The backache may be complained of on either one or both sides of the vertebral column. In the majority of cases the disability is described as a bilateral one, and the observations eventually are those of involvement of both kidney pelves. One can never definitely say, because a backache is localized to one side, that only that side is involved; more often the condition is bilateral; also the question of renorenal reflex must be considered. Backache in this condition is deep seated, which assists in differentiating it from the more superficial conditions of myalgia and neuralgia. The patient describes the condition as a dull ache, somewhat diffusely felt in the lumbodorsal region, not relieved to any extent by rest and practically constant. We have not been able to find any cases in which it is described as a "dragging" sensation.

In our observations we have determined that a similar type of backache is elicited in other urologic conditions, such as hydronephrosis, pyonephrosis, renal neoplasm and renal tuberculosis.

PTOTIC BACKACHE OR NEPHRALGIA

Kaufmann [4] has stated that backache in nephroptosis is rather rare. In view of our observations already described in a previous article,[5] we cannot subscribe to that statement. With the newer methods now in vogue to demonstrate renal ptosis, we are becoming more familiar with the backache complained of by these patients. In our series of 343 patients, backache was complained of in 179. So far as localization is concerned, it is similar to that of chronic pyelitis. It is, however, more often described as a "dragging" sensation and, contrary to that found in chronic pyelitis, it is usually relieved by rest, which is easy to understand, since in the prone posture the kidney usually seeks its normal bed, and in this way drainage of the pelvis is reestablished. The backache in these cases becomes more severe as the day progresses, as the result of the stasis in the kidney pelvis and the dragging on the renal attachments and pedicle.

In addition to the patients complaining of backache in this ptosis series, a further 117 complained of renal pain, confined largely to the lumbar region and often bilateral. In fifty-six cases distinct renal colic was elicited. When renal pain and occasional colic are complained of by patients with renal dystopia, they are probably due to the resulting stasis and urinary infection complicating the dystopia, pyelitis being the end-result along with an associated ureteritis and cystitis. Add to that the fact that many of these patients have definite kinks and angulations of the ureter, with resultant interference with normal ureteral peristalsis, and ureteral colic is inevitable.

4. Kaufmann, L. R.: J. Am. Inst. Homeop. **23**: 539 (June) 1930.
5. Morris, H. L.; Sherman, E., and Brunton, J. F.: Renal Dystopia, Am. J. Surg., September, 1932.

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CALCULUS BACKACHE

We have studied, in minute detail, thirty-two cases of renal calculus disease with backache. In practically all cases the disability is complained of in the costovertebral region. Pain reference is not a feature when the calculi are confined to the renal pelvis. A true backache or nephralgia is not encountered. In every case the complaint is that of pain. It is remarkable the length of time some of these patients can put up with persistent, paroxysmal pain in the costovertebral region. In one of our cases it had been present for thirty-five years, but we would hesitate to say, of course, that the renal calculus had been definitely present in the pelvis for that length of time.

On palpation of the dorsal renal regions in the presence of calculi, the areas complained of are much more tender and sensitive than in other renal conditions. A definite tenderness can also be elicited on palpation of the abdomen, over the region corresponding to the kidney pelvis involved. This type of renal disease gives rise to the true paroxysmal renal pain, at times more severe than others, but never as severe as that found in cases in which migration of the calculus has begun with involvement of the ureter.

Ureteral calculus, in our sixty-three cases, has demonstrated how infrequent is the typical colic. These patients, in a carefully taken history, will often describe a typical ureteral calculus colic, but in one half of the cases that we have studied, we have not elicited this syndrome. There is a marked tenderness in the lumbar and costovertebral region, with an associated tenderness in the abdomen over the region of the involved ureter at the site of the stone. Pain reference in these cases is toward the flank. The infrequence of the radiation of pain to the thigh and genitals, as described by various authors, has been noted by us in this series.

PROSTATIC BACKACHE

Backache among male patients is caused in a large number of cases by inflammatory changes in the prostate and vesicles. Of the 507 men examined who had complained of backache, 329 had involvement of these structures. In this respect our observations are similar to those of Caulk,[6] in which he reported 80 per cent of low backache in men as having origin in the prostate and vesicles.

The backache in these cases, we are forced to conclude, is frequently described as "lumbago," and often treated medically from that standpoint without proper investigation being carried out to eliminate infection in the structures of the genitalia. Too often a single prostatic massage is considered sufficient, and if no microscopic evidence of infection is present, no further search is made.

The complaint in practically every case is that of a sacral disability. We have not observed many cases of radiating pain. If the pain is referred, it usually follows the course of the sciatic nerve, and more rarely the inner aspect of the thigh and groin. These patients often speak of it as an arthritic type of rheumatism. Kaufmann has used that term to describe the metastatic type with origin in the prostate and vesicles. A typical description, by a patient with prostatic backache, is that it is most pronounced on arising, but improves with activity, and subsides as the day progresses. It is a dull aching type of pain, aggravated in many instances by sexual excitation.

6. Caulk, J. R.: J. Missouri M. A. **25**: 555 (Dec.) 1928.

Duncan, in an address before the Urological Society at the Cleveland Clinic, April 27, 1932, stated:

> We have found that in at least one third of our patients complaining of low back and joint symptoms, a definite prostatic infection can be demonstrated. The importance of the part played by prostatitis in backache and arthritis is to some degree brought out by the very close cooperation between the genitourinary department and the department of orthopedic surgery in the investigation of these individuals. No case of backache or joint complaint goes without investigation of the genitourinary tract for possible sources of infection by some member of the staff of that department. We believe that it is a relatively futile process for any one other than a person primarily interested in that field to pass satisfactorily upon what is found. The significance of prostatic infection in individuals complaining of pain in the lower back is never brought out more distinctly than in the man who, over a period of months or even years, has been approached by removal of tonsils, abscessed teeth, has been fitted with a low back brace, has received innumerable types of physical therapy, including manipulation, and in whom it is found on prostatic examination that marked infection is present, who within a relatively short period goes on to complete relief from his backache and the general symptoms attributable by his many attending physicians to a general neurotic tendency. Instances such as these, which are frequently seen, bear out from our point of view the necessity for routine examination of the prostatic secretion, possibly on more than one occasion. In many instances, particularly in individuals complaining of symptoms that might be attributable to any remote focus of infection, the presence of gross dental and tonsillar infection with constipation as well is no indication for failure to investigate the genito-urinary tract as an additional source of absorption. It is equally reprehensible, in such instances as these, to fix one's attention primarily upon the prostate gland and neglect those foci which in many instances are known to be primary centers from which blood-borne infection is spread to the prostate.

One can readily understand why infection of the prostate and vesicles may give rise to such an extensive disability, when it is considered that there is such an abundance of blood and lymph channels in and around these structures. Von Lackum[7] has stated that the prostate can produce symptoms in one of three ways: (1) by infected blood, borne from foci in the prostate, (2) by toxins, blood-borne from the prostate gland, and (3) by reflex nervous impulses originating in this gland and resulting in pain in distant regions. The lymphatics are numerous and form a network on the lower and posterior surface of the organ, from which on either side pass the obturator lymph nodes of the pelvic wall, and the lateral and larger ones terminate in the internal iliac nodes.

DIFFERENTIAL DIAGNOSIS

As we have stated before, the chief conditions which are to be considered as etiologic factors in the production of backache are found in the three branches of medicine, viz., orthopedic, gynecologic and urologic. It is necessary, therefore, for the urologist to be able to include in his examining armamentarium a knowledge of the means of differentiating the conditions found in the two other specialties, although he may not be directly concerned with them.

Examination of the back is often neglected, or is frequently performed in such a cursory manner as to be without value. It is not a difficult task to determine if there is rigidity or limitation of movement of the back muscles, or tenderness over the sacro-iliac or sacrococcygeal joints, with pain on passive motion. First percussion over the entire back, the spinal column

7. Von Lackum, W. H., and Holloway, J. K.: M. J. & Rec. **122**: 23 (July 1) 1925; 64 (July 15) 1925.

and the iliac crests will often achieve differential results. A large number of backaches in women are due to fatigue of the back muscles and, according to Sturmdorf, a protective tilting of the lumbosacral articulation. Postural defects must be considered.

In gynecopathic conditions careful vaginal examination should be performed to eliminate the presence of conditions such as retroversion, prolapse and pelvic inflammatory disease. If the history is carefully taken it will be noted that the backache is often worse during the menstrual cycle. Stevens [8] has stressed the necessity for urologists to become adept in performing vaginal examinations to rule out pelvic changes, and a discovery of pelvic inflammatory disease may be an impetus to further investigation and discovery that the backache is urologic and secondary to the pelvic disease.

The backache accompanying prostatovesicular infection is usually diagnostic when following the classic description. Meyerding,[9] in a recent paper, described his observations in spondylolisthesis as occurring more commonly among men who have been active in pursuits involving heavy labor, and between the ages of 20 and 60 years. He considers that this condition is more common than was previously thought. This is a feature that must be ruled out since it involves the lumbosacral articulation. There is, however, always a history of trauma in spondylolisthesis.

CONCLUSIONS

1. In a review of 3,600 case histories, backache of urologic origin was found in 31 per cent. There were 620 female and 507 male patients.

2. A qualifying classification is presented as an aid in the differential diagnosis of backache.

3. The majority of patients with chronic renal lesions refer to their disability as backache and not back pain.

4. The backache of pyelitis is a constant dull, deep-seated ache, diffusely felt in the lumbodorsal region.

5. The backache of ptosis is similar to that of chronic pyelitis, but in addition is of a dragging character and is relieved by rest.

6. The disability in renal calculus disease is not a true backache, but a persistent, paroxysmal pain in the costovertebral region which is intensified, with radiation, as the calculus passes through the ureter.

7. Prostatic backache is a dull aching sacral disability, which is most severe on arising, and is occasionally referred along the course of the sciatic nerve.

8. The urologist should be familiar with the means of differentiating backache caused by urologic conditions from backache occurring in gynecologic and orthopedic diseases.

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ABSTRACT OF DISCUSSION

DR. R. L. GORDON, New Orleans: While hypernephromas may be seen now and then, backache has to be dealt with every day. The authors have brought out that at least the gynecologist and the orthopedist should realize that the urologist also should be concerned about the backache, particularly in women. I was surprised to find in the classification of more than 3,000 urologic cases that 31 per cent of the patients have backache. The authors spoke of 507 men and 629 women. That brings out the point mentioned, that the urologist should have a working knowledge of gynecologic examination. The authors spoke of the backache of pyelitis being dull. That is true. It is easy to understand why backache in ptosis is relieved by lying down. When one is standing, the kidney begins to press on its neighbors and there is some kinking of the ureter, causing back pressure on the pelvis of the kidney. When one is lying down the kidney returns home and there is no kinking or twisting of the ureter; hence the backache is relieved. In calculi, particularly ureteral calculi, the amount of backache is entirely due to the amount of backpressure produced, barring, of course, the sharpness of the stone. Prostatic pain is very common. I agree that numerous examinations should be made to discover whether or not the prostate is infected. A negative secretion is often obtained at first because of failure to empty the gland properly. I never regard a prostate as normal until it has been examined two or three times.

DR. A. I. FOLSOM, Dallas, Texas: I want to call attention to a reflex from the female urethra that gives the identical backache in women that one gets from the prostate or the posterior urethra in men. This is something that has not been taken seriously into account. A Frenchman, in 1850, wrote a treatise on the reflex motion emanating from the female urethra. I have seen quite a large number of these pains in the female which, in my judgment, have been definitely proved to be reflex pains from the urethra, and this low sacral backache has been a frequent manifestation.

DR. GIDEON TIMBERLAKE, St. Petersburg, Fla.: In regard to the condition referred to by Dr. Folsom, I wonder whether these reflex pains are not actually those from traction about the bladder neck resulting from sagging bladders consequent on perineal lacerations. I suspect that primiparas have no such pathologic conditions as were mentioned in the discussion. At least, I have been unable to detect them.

DR. J. DELLINGER BARNEY, Boston: I did not hear the authors mention the possibility of backache being due to lymphoblastoma. This is not an infrequent cause of pain in the back in both sexes, and in children. There may not be the finding of blood in the urine but it may be diagnosed by blood examination, the x-rays or other methods, and it should be kept in mind in every case.

DR. W. J. WALLACE, Oklahoma City: Stricture or obstruction in the male urethra is a cause of backache. I frequently find male patients who have intense pain in the sacrolumbar or sacro-iliac region who give a history of having had every form of examination. Eventually a stricture of the urethra is found, sometimes associated with a general narrowing of the entire urethra. This is accompanied by changes in the prostate, seminal vesicles and bladder. Just recently I had a case of this kind in a man, aged 43, who complained of terrific pain in the sacrolumbar area. He had had all forms of treatment without relief. Examination revealed a small urethra barely admitting a size 20 sound, with a stricture at the bulb and a marked contracture at the vesical neck. Dilation of the urethra and the neck of the bladder, associated with massage of the prostate and the vesicles, made his backache disappear. This is one instance; but I can recall a great number similar to this one and I urge urologists not to overlook the pathologic conditions of the male urethra as a cause of backache.

DR. PAUL R. STALNAKER, Houston, Texas: I wish to corroborate what Dr. Folsom said about the female urethra. During the past year I have had under observation several women with pus in the urine, the dominant symptoms being dizziness and backache. I could not account for the pus but concluded that it came from the urethra. As the result of cleaning up Skene's glands and local treatment, the backache and the dizziness disappeared. While I find that there is a tendency to recurrence, the condition can be easily kept relieved.

DR. ROBERT GUTIERREZ, New York: In a recent study of twenty-five cases of horseshoe kidney I found that as a rule these patients complained of pain across the back, or along one or both of the lumbar regions, radiating toward the back. This pain is due to the pressure on the nerve, lymphatic and blood supply of the anomalous organ causing lack of drainage. I have also noted the persistence of these backaches in cases of hypoplastic kidney. The pain is present in both lumbar regions. On one side it is due to the infantile kidney, the function of which is greatly diminished, and on the other side it is caused by the compensatory functional hypertrophy of its mate. These bilateral pains are very misleading in the

8. Stevens, W. E.: J. Urol. **27**: 103 (Jan.) 1932.
9. Meyerding, H. W.: Surg., Gynec. & Obst. **54**: 371 (Feb., No. 2A) 1932.

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diagnosis and therefore demand a most scrupulous urologic examination.

DR. H. L. MORRIS, Detroit: I am glad that Dr. Folsom called attention again to the female urethra. Since his discussion a year ago we have attempted to find some of the things he showed, but so far we have not been able to find just what he does. I wish to thank Dr. Gutierrez for calling attention to anomalies, which we did not mention in particular but which his recent writings have covered. In regard to what Dr. Gordon said about pain in the urethra as the result of inflammatory lesions, we assume that all these patients have infection of the prostate or the seminal vesicles, or perhaps both.

SOME STUDIES ON MIDDLE EAR INFECTION

JAMES A. BABBITT, M.D.
PHILADELPHIA

Analysis of the results of research in some of the major practical problems of otolaryngology, and review of the literature pertaining thereto, is convincing on one point. In the vast array of widely divergent therapeutic measures, all the varied practical procedures evolved by investigators of merit would seem to have had a modicum of success, and their advocacy is sincere. This applies to the two great problems of otology—progressive deafness and chronic middle ear infection, with their traveling companion, tinnitus aurium—whether such measures are routine palliative, surgical, or on the broader basis of biochemistry, endocrine imbalance or allergy.

The purpose of this contribution is simply to present some further studies and opinions on the practical treatment of persistent middle ear infection. The groups studied are not large, and for purposes of this study a separate classification of the true otorrheas and ears presenting persistently recurrent discharge has not been made. From a practical standpoint, such a discharge, even with slight intermissions, and without obvious background for the recurrence, presents a routine problem. The list of cases in which modified attic procedures were performed, reported in April, 1931, has been augmented by all the available cases in three hospital groups since that time. Even so, the list is small, and conclusion could only rightly be termed preliminary. A cross-section review will be made, and the results candidly expressed.

The middle ear should in definition include the tympanic cavity, with the attic, the eustachian tube and the mastoid process. Therefore, the etiologic factors concern the threefold area. To the otologist the tympanic area with its mesial wall, containing the promontory, corresponding to the first turn of the cochlea, the oval window above and the round window below, the facial canal behind and the covering of the external semicircular canal above and behind is of increasing interest. The traumatic possibilities here, from incisional or manipulation efforts on foreign bodies, are joined to the dangers of suppurative necrosis and bone dehiscence. A careful study of the specimen presented will, however, limit the probable injury from tympanic incision.

Acute and chronic suppurative otitis media presuppose extension of infection from the nasopharynx through the eustachian tube, by direct transmission from the blood or lymphatic stream (thrombotic in the exanthems) or by extension from infection in the external auditory canal. Infections in the nasopharynx or posterior ethmoidal area of the nares, septic tonsils, teeth and sinuses are of importance, and the management of presenting intratympanic involvement demands a careful scrutiny of these areas.

As the sequence of persistent infection bears such close relation to the adequate diagnosis of the tympanic membrane, its drainage in the proper manner and at the proper time, the value of the picture presented by the line of the malleus, and its short process, the vascularity bordering the annulus and along the malleolar line, the differentiation of surface myringitis and the occasional horizontal fluid line should all be emphasized. A careful comparison with the unaffected ear with perfect illumination will aid in the opinion as to Shrapnell's area. Tobey's[1] contention appears reasonable that the incision should be a long one, if the tympanic membrane is to be opened, commencing near the posterior commissural fold, well away from the vessel supply of the annulus, as demonstrated by Potter,[2] and well around at the base. One incision ought to suffice save to remove congealed secretion, for later incision encounters inflammatory sequence and scleroses, and secondary drainage is often more damaging than satisfactory. Perhaps the advocated early mastoid drainage would be preferable to secondary openings, yet many mastoids suggesting clouded involvement by roentgenographic study do clear up. There is no evidence that hasty operation on the mastoid leaves the ear in a better condition than one spontaneously quieted through careful drainage and rhinopharyngeal attention. Perhaps sufficient study of ossicular mobility in later years in relation to hearing and tinnitus might disprove this. The single point to be made is, if the ear is to be opened, do it thoroughly and once for all.

Almour,[3] working with Kopetzky, has made a valuable contribution, based on the teachings of Wittmaack,[4] as to the influence of the two types of infantile otitis on sequent continued discharge as well as mastoid changes. In the first, the otitis media neonatorum, due to foreign substance of respiratory invasion of the middle ear, hyperplasia of connective tissue occurs, preventing the normal contraction of the subepithelial layer, a cessation of pneumatization and resultant sclerosis of the mastoid. This sclerotic type of mastoid, which is constantly obtaining better interpretation by roentgenologists, bears an important relation to subsequent attic, antral and mastoid procedures, and consequently vitally concerns both therapeutic and surgical consideration of continuous discharge. The second infantile type, the true infantile suppurative ear, is followed by fibrosis, and if at the proper stage before pneumatization, results in the retention of bone marrow in the mastoid cells and gives the typical picture of diploic mastoid which likewise modifies treatment of attic discharge. In these two states, according to this view, the true coalescent mastoid cannot occur.

The routine of treatment of middle ear infection would be modified by the character and sequence in the

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1. Tobey, G. L.: Conservative Middle Ear and Mastoid Operations, graduate lecture delivered before the American Academy of Ophthalmology and Oto-Laryngology, 1931.

2. Potter, A. B.: The Ear Microscope: Its Description and Its Use as a Clinical Instrument, Ann. Otol., Rhin. & Laryng. 40: 201 (March) 1931.

3. Almour, Ralph: The Significance of the Squamous Epithelium in the Cause and Repair of Chronic Suppurating Middle Ear Disease, Tr. Am. Acad. Ophth., 1930, p. 337.

4. Wittmaack, K.: Ueber die normale und pathologische Pneumatisation des Schläfenbeins einschliesslich ihrer Beziehungen zu den Mittelohrenkrankungen, Jena, Gustav Fischer, 1918.

perforation. If it is the central self-limiting type of perforation following tympanic mucosal infection, without cholesteatoma, the palliative expectant treatment is justified; if it is lateral wall perforation with insweep of squamous epithelium and aided by fibrous walling off following infantile otitis neonatorum, or the poor drainage type commencing by small indenture in Shrapnell's area and tiny perforation and probable formation of attic-antral cholesteatomatous tumor, the question of adequate surgical drainage, for which the modified attic operation has been suggested, is an important one. Opening with safety a broad path of drainage, to substitute the irregular almost thread-like passage is a logical plan, even if its major success depends on giving a larger field for squamous epithelization.

The end-results in routine palliative treatment would seem to depend on three important factors: (1) the correct interpretation of its type, (2) the elimination of continuing factors in etiology and (3) the technical skill in treatment. The last is much more important than it appears. It includes the utmost gentleness in treatment because the delicate structures of the middle ear resent traumatism more than elsewhere, quick adaptation to changes of treatment indicated by progress in the ear itself and maintenance of cooperative morale in the patient.

The treatment by iodine powder has become so universal that its efficacy has perhaps been overestimated. The admirable report by Harkness [5] in review of the year's work has probably given a fair expression of its acceptance throughout the country. To be successful, the powder must actually reach the tympanic cavity, it should not increase excoriation in the external canal and in certain antral-attic conditions where drainage is essential it should not be used in such quantity as to dam back the secretion. Its end-results in a considerable number of cases, when judiciously used, have been most satisfactory, and it does not seem to have physiologically changed the parietal tissues more than other medicaments.

It has been our intention to adopt the method of attic surgical drainage only in those cases which appeared to defy palliative treatment and would otherwise have justified radical operation on the mastoid. This opinion is gaged by the duration and character of the discharge, the static appearance of the tympanic membrane, the location of the perforation and the impression of definite chronicity. Careful audiometric and tuning fork records are made before operation, when feasible, and save in case of previous simple operations on the mastoid the sclerotic or diploic status is determined before operation. Under such selection, any percentage of success might be accepted with a minimum of criticism. Cases are not all successful, or even partially so, but no material damage has been done to the patient or his ear. A group of six of these unsuccessful types have been observed carefully during the last few weeks with the help of my associate, Dr. Wolff. Two of these might even be termed partially successful, but resulted in small apertures in the border of Shrapnell's area, which continued to throw off detritus, occasionally liquid. The others had persistent granulated areas with polypoid tendency, in the lower quadrants. All routine palliative measures seemed to fail—irrigation, dry treatment with iodine powder, even application of chromic or trichloracetic acids. It was determined to try out the dye treatment. Two per cent acriviolet was used, made from a combination of acriflavine and gentian violet. This was given a faithful trial but failed in all but one case. The entire group of patients had increased irritation and discharge, possibly due in some measure to our technic. As a final resort, and stimulated by the almost 100 per cent success reported by Asherson [6] of London, and experiences reported from various sections of this country, zinc ionization was given a trial. This so far has proved more efficacious than the other methods, although the perforations were not of Asherson's favorable central type. Only the test of time will demonstrate its success.

A laboratory study was instituted to attempt a solution of what is the best routine form of after-treatment. Bacteriologic research directed on the middle ear, both ante mortem and post mortem, has been generous in this and other countries. It does not appear, however, that this has been applied so frequently to infants and very young children. The blood studies were suggested by the papers of Weiss [7] and Kopetzky [8] in New York. It seemed worth while to see what difference would appear in bacterial culture taken by needle puncture on cleansed membrane from the intratympanic field, and how this compared with similar intratympanic pictures after periods of continued tympanic discharge. The contaminating evidence obtained on examination in the later period might be helpful in directing the hospital routine in cleansing. The error in the equation comes, of course, from the frequent coexistence of other systemic ailment in the hospital patient. This, of course, applies more particularly to the blood studies. We were most anxious to obtain some indication from the routine counts of young or staff nucleated cells and the relation of this to progress of the disease. As the group available during the preparation of this paper was only about sixty, this too is but a preliminary suggestion.

Studies were carried on at the Children's Hospital in Philadelphia during February, March and April, 1932, on four group series, which will be briefly discussed in the order outlined. Bacteriologic cultures were made on heart infusion blood agar plates, and strains identified by Dr. A. D. Waltz, chief of the laboratory, and blood counts and differential smears made by Dr. John D. Donnelly. All this was done in connection with otolaryngologic service on routine hospitalized patients with the exception of four intratympanic cultures, which were taken in the outpatient department.

In the sixty-one cases studied, many systemic conditions pertained either prior to, or coincident with, the suppurative otitis media or sequent mastoiditis. For example, twenty patients presented pneumonia or other thoracic complications; gastro-intestinal, cardiovascular, neurologic, syphilitic or tuberculous conditions predominated in the other groups. Of the entire list, only eighteen cases could be claimed as distinctly and primarily aural conditions. The larger group was studied to obtain some information on the blood differential changes in infants and the associated tympanic bacteriology. The entire group had pathologic ears, but the aural condition was an associated one save in the limited group. The severity of the associated con-

5. Harkness, G. F.: Progress in Otolaryngology, Ann. Otol., Rhin. & Laryng. **40**: 1250 (Dec.) 1931.

6. Asherson, N.: Zinc Ionization in the Treatment of Chronic Suppurative Otitis Media, Laryngoscope **42**: 141 (Feb.) 1932.

7. Weiss, M. A.: The Prognostic Value of the Blood Examination in Otology, Collected Papers of the Otolaryngological Clinic of Beth Israel Hospital, New York, Bull. no. 4, 1930.

8. Kopetzky, S. J.: Laboratory Aids in Otology, Laryngoscope **38**: 416 (June) 1928.

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ditions is attested by the fact that ten of these patients died during the period of study. Fortunately, none of the deaths occurred in the group with aural and mastoid diseases.

I. GENERAL BACTERIAL EXAMINATION OF MIDDLE EAR DISCHARGE

The ears were carefully cleansed and cultures taken through the perforation directly from the middle ear. Seventy-five ears were cultured in this series, and as a guide for local measures of treatment in later studies to be undertaken, the prevalence of certain types, either alone or in combination, was determined. Staphylococcus albus appeared in twenty-seven ears, Bacillus coli in twenty-five, hemolytic streptococcus in nineteen, diphtheroid types in ten, Proteus vulgaris in eleven, Staphylococcus aureus in ten, pneumococcus in four, and other isolated organisms. We did not succeed in isolating tuberculosis bacilli from any stained smears. It is interesting to note that in thirty-five culture plates, single organisms appeared. Others may have been there but did not grow on incubation. In single colony types the order of frequency was as follows: Bacillus coli, Proteus vulgaris, Staphylococcus aureus, Staphylococcus albus, Streptococcus hemolyticus and Bacillus pyocyaneus. In the group of primary aural conditions, Streptococcus hemolyticus and Staphylococcus aureus predominated. In the pulmonary disease associated with middle ear infection, predominant organisms in culture followed this order: Staphylococcus aureus, Staphylococcus albus, Bacillus coli, Proteus vulgaris, Streptococcus hemolyticus and pneumococcus. It is interesting to note the position of the last. Proteus vulgaris, owing to its spreading growth, would naturally obscure other types of organisms.

Intratympanic Culture.—In making intratympanic cultures, the auricular canal and tympanic membrane were antiseptically cleansed. A small aspiration needle was carefully thrust through the most bulging portion of the membrane and the piston drawn. Twenty-two ears were cultured by this procedure, and from three no organism was obtained, the lesson of which carries its own suggestion. In one half of these, single organism colonies resulted. In the series of nineteen positive results from intratympanic cultures, Streptococcus hemolyticus and Staphylococcus aureus and albus predominated; Bacillus coli and Proteus vulgaris did not appear, and this was to be expected. In one half of the cases of distinctively aural disease in this group, single organism cultures were obtained.

II. BLOOD STUDIES

The two groups of outlined studies will be discussed together. In these studies emphasis was placed on the leukocyte and differential count, particularly to determine the behavior of the immature neutrophils in ear infections, as well as ear infections in association with other systemic pathologic processes. Two hundred and forty-nine blood counts were made, of which 102 included red blood cell and hemoglobin estimation. It was noted, however, in the course of this study that the two correlations, total red blood cells vs. hemoglobin and total white blood cells vs. neutrophil count, presented little of value in the group of aural conditions with coincident systemic disease, particularly on account of the frequent blood transfusions. It is interesting to observe that in six of the ten cases of systemic disease which terminated fatally there was a marked Schilling shift to the left as the disease progressed. In children we did not find high staff cell count (myelocyte, juvenile or stab forms), except in gross sepsis or very sick babies. Other forms of white cells, especially eosinophils and lymphocytes, deserve an equal place in this discussion, but their record will be preserved for later consideration.

In the following cases reported, studies were made during the course of the disease on the correspondence of the red blood cell count and hemoglobin, the white blood cell and neutrophil count and the von Schilling shifts in the immature forms. To conserve time the notation as to what happened in the study of the more important and primarily aural conditions will be brief:

CASE 1.—R. M., a girl, aged 8, responded favorably to a modified attic operation. Seven blood counts were made. Red blood cell and hemoglobin correspondence was not very consistent; white blood cell and neutrophil correspondence was more uniform. There was a definite shift to the left in the later counts, changing to the right during the final convalescence.

CASE 19.—R. O., a boy, aged 9 months, had bilateral otitis media. He had been in the hospital two months before with pneumonia. White blood cell and neutrophil correspondence was not consistent. Blood examination showed a definite shift to the left, returning to the right on the patient's recovery.

CASE 25.—F. S., a boy, aged 9 months, had microcephalia with subsequent pneumonia. Red blood cell and hemoglobin correspondence was consistent; white blood cell and neutrophil correspondence, only fairly consistent. There was a definite shift to the left throughout. The boy did not improve.

CASE 36.—R. G., a boy, aged 11 years, had a modified attic operation on both ears; seven blood examinations were made. Red blood cell and hemoglobin correspondence was consistent; white blood cell and neutrophil correspondence was not consistent. There was a shift to the right with improvement in the condition, but the staff cells were low in number, less than the average.

CASE 38.—J. C., a boy, aged 15 months, had otitis and persistent eczema. Red blood cell and hemoglobin correspondence was fairly consistent; white blood cell and neutrophil correspondence, very consistent. There was a shift to the left at the beginning, changing to the right when the patient recovered.

CASE 40.—C. J., a girl, aged 9 years, was admitted to the hospital in a delirious state with mastoiditis suspected and subperiosteal abscess anterior to the ear. Nine blood examinations were made. Red blood cell and hemoglobin correspondence was consistent; white blood cell and neutrophil correspondence, not very consistent. There were marked changes in the shift, first to the left then to the right, back to the left during apparent reinfection, then steadily to the right as the patient's condition improved.

CASE 42.—P. A., a boy, aged 5 years, had rather septic bilateral otitis media; mastoiditis was suspected; attic drainage was done to abort; there was some complication with adenitis. Ten blood examinations were made. Red blood cell and hemoglobin correspondence was consistent; white blood cell and neutrophil correspondence was only fairly consistent. There was an early definite shift to the left, which increased on subsequent counts, then to the right for one count, and back to the left in the later examinations.

CASE 45.—M. G., a girl, aged 6 years, had chronic right suppurative otitis media. She improved markedly after tonsil and adenoid operation. Red blood cell and hemoglobin correspondence was consistent; white blood cell and neutrophil correspondence was not consistent. There was a shift to the left, then to the right, with some increase in staff forms on the patient's recovery.

CASE 46.—M. W., a girl, aged 2 years, entered the hospital with peritonsillar abscess and right suppurative otitis media; a mastoid operation was done. Nine blood examinations were made. Red blood cell and hemoglobin correspondence was con-

sistent; white blood cell and neutrophil correspondence was not very consistent. There was a shift to the left during peritonsillar trouble, back to the right, then to the left with the onset of the symptoms of mastoiditis, and back to the right on the patient's recovery.

CASE 62.—A girl, aged 22 months, had mastoiditis. Red blood cell and hemoglobin correspondence was fairly consistent; white blood cell and neutrophil correspondence, very consistent. There was a shift at first to the right, which changed to the left in the acute stage, then to the right.

TABLE 1.—*Special Leukocyte Study on Patient B. I.*

B. I., aged 1 year; suppurative otitis media; arthritis; streptococcic blood stream infection

Date	White Blood Cells	Baso-phils	Eosino-phils	Juve-niles	Stab Forms	Seg-mented	Lym-pho-cytes	Mono-cytes
3/22	27,200	...	...	10.0	17	48	21	4.0
3/24	26,100	...	1.0	6.0	14	47	26	6.0
3/25	24,700	0.3	0.7	7.0	15	51	23	3.0
3/26	17,250	...	...	9.0	10	45	32	4.0
3/29	21,800	0.3	0.7	4.0	10	54	24	7.0
3/31	21,100	...	0.3	3.0	7	53	30	6.7
4/ 2	17,800	1.5	...	0.5	5	51	33	6.0
4/ 8	21,300	...	...	2.0	11	70	12	5.0
4/11	19,200	...	1.0	1.5	5	49	37	7.5

COMMENT

Review of these cases would indicate doubtful value in both correlation groups, but some diagnostic and treatment indication in the staff cell shifts. The staff counts were far less consequential in the special cases of aural disease than in many associated with other disease. For illustration, tables 1, 2 and 3 give the laboratory blood studies in a case of (*a*) streptococcic blood stream infection following abscess of the thigh, (*b*) pneumonia with hemolytic jaundice and (*c*) empyema, all with aural complications.

We do not wish to emphasize, therefore, these minor shifts but offer them in connection with middle ear studies.

III. ANALYSIS OF RESULT IN MODIFIED ATTIC OPERATION

The descriptive technic of the modified attic operation will not be presented here as it has already been published.[9]

TABLE 2.—*Special Leukocyte Study on Patient J. H.*

J. H., aged 5 months; suppurative otitis media; pneumonia and hemolytic jaundice

Date	White Blood Cells	Baso-phils	Eosino-phils	Myelo-cytes	Juve-niles	Stab Forms	Seg-mented	Lym-pho-cytes	Mono-cytes
2/22	35,600	...	...	..	9.0	16	44	26	5.0
2/24	33,000	0.5	...	..	9.5	22	43	19	6.0
2/25	30,300	...	...	..	5.0	17	41	33	4.0
2/26	17,500	...	...	..	6.0	10	42	36	6.0
3/28	28,600	...	...	..	11.0	17	38	30	4.0
3/29	17,150	...	0.7	..	6.0	17	41	33	2.3
3/30	9,300	...	...	..	8.0	14	25	50	3.0
4/ 1	10,700	...	...	..	7.0	16	29	40	8.0
4/ 2	13,500	...	0.5	..	6.0	18	35	33	8.0
4/ 4	16,000	...	1.0	..	5.0	12	29	43	11.0
4/ 8	11,000	...	0.5	1	3.0	18	39	32	6.0
4/11	12,200	0.3	1.0	..	9.0	18	36	28	7.0
4/13	10,400	0.5	1.5	..	4.0	10	29	49	6.0

The analysis presented is on an operative group of sixty-one patients, in nineteen of whom the condition was bilateral—a total of eighty individual ears. This list should be divided for purposes of discussion into a University Hospital group of eighteen; Lankenau Hospital group of nine; Children's Hospital group of twenty-one; Mary Drexel Children's Hospital group of five; office group, local anesthesia, multiple stage, four; Graduate Hospital and Bryn Mawr Hospital groups, each one.

The University Hospital group was almost entirely a dispensary group, but the patients were mostly older and of better class than those presented in the Children's Hospital group. The latter had a poor physical background; when ambulatory they had poorer home attention and were less cooperative. This was demonstrated in the percentage of successful cases, which was in the proportion of 67 : 57.

The Lankenau Hospital, Bryn Mawr Hospital and office groups included largely private patients with favorable physical background, and the success percentage was above 90. The Mary Drexel group, on the other hand, was a mixed one, and the favorable list not much above 50 per cent.

In presenting a total summary of the eighty ears, certain factors should be premised. First, as to the indication for operation. It is not at all certain in how many of these cases the condition might have cleared up under more persistent palliative treatment. The picture in nearly all the cases was that of exhausted patience with routine procedure. The discharging ears did not show indication of response to routine measures, and the modified attic operation presented a shorter process without great shock or danger to hearing. The subsequent hearing tests have generally shown improvement, sometimes very marked, but the comparative record must be discounted by the fact that preliminary tests had to be taken with at least some slight moisture present.

TABLE 3.—*Special Leukocyte Study on Patient C. P.*

C. P., aged 6 months; suppurative otitis media; empyema; death

Date	White Blood Cells	Eosino-phils	Juve-niles	Stab Forms	Seg-mented	Lym-pho-cytes	Mono-cytes
2/23	31,600	...	2.0	7	62	22	7.0
2/29	12,500	1.0	1.0	5	55	29	9.0
3/ 4	19,850	...	1.0	8	54	29	8.0
3/16	12,850	...	2.0	7	51	28	12.0
3/18	18,500	...	2.0	10	46	36	6.0
3/21	16,600	2.0	1.0	6	66	21	6.0
3/25	36,700	0.5	5.5	14	57	14	9.0
3/26	35,100	...	9.0	10	48	25	8.0
3/28	36,800	...	5.0	13	60	15	7.0
4/ 2	34,500	...	5.0	13	57	17	8.0

In scarcely any of the cases in which operation was done was the perforation of the central self-limiting type which has been discussed in the Almour and Kopetzky [10] presentations, which should be aided by iodine powder and which, according to Asherson, have contributed to the high percentage of recovery under ionization.

Again, not all the reinfecting factors from the nasopharynx have been eliminated in this list. It is easy to influence patients to submit to operative measures for relief of the immediate suppurative condition, but more difficult to obtain cooperation in the associated or preliminary nasopharyngeal elimination.

In the convalescent care of these patients, it is difficult to evaluate the contribution of the more careful routine topical treatment incident to postoperative attention. Iodine powder was frequently used as an adjuvant,

9. Babbitt, J. A.: A Modified Attic Drainage in Chronic Suppurative Otitis Media: Preliminary Report, Ann. Otol., Rhin. & Laryng. **40**: 348 (June) 1931.

10. Almour,[5] Kopetzky.[5]

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and biochemical aid was sought in the dietary and vitamin regulation instituted and applied from the teaching of Jarvis, Stucky and their nutrition groups.

Still another factor is the difficulty in keeping track of patients for sufficiently long postoperative period. Some of these patients on the presented list may have

TABLE 4.—*Modified Attic Operations in the Various Groups*

Patient	Age	Ear	Duration	Date of Operation	Case Comment	Ear Result
				University Hospital Group		
E. C.	30	Right	15 yrs.	March, 1929	Deafness not improved	Dry ear
M. R.	27	Left	12 mos.	May, 1930	Atypical neuralgia relieved	Dry ear
M. C.	14	Right	2 yrs.	January, 1931	Marked necrosis	Not improved
R. H.	4	Left	2 yrs.	February, 1931	New membrane formed	Dry ear
E. R.	15	Right	4½ yrs.	February, 1931	Cholesteatomatous case	Improved
U. G.	29	Both	10 yrs.	March, 1931	Postoperative observation brief	Dry ears
H. S.	16	Left	13 yrs.	May, 1931	Adenoids also removed	Dry ear
E. B.	19 mos.	Both	5 mos.	May, 1931	Brief recurrence with bronchitis	Dry ears
D. H.	7	Left	5 yrs.	August, 1931	Labyrinthine complications; acriviolet; ionization	Not improved
E. R.	30	Both	25 yrs.	January, 1932	New membrane formed	Right 90% dry; left dry
M. Y.	10	Right	5 yrs.	February, 1932	Previous radical mastoid operation	Dry ear
E. S.	28	Left	25 yrs.	February, 19.2	Active mastoiditis	Not improved
W. D.	4	Both	Right, 1½ yrs. Left, 1¼ mos.	March, 1932		Dry ears
E. G.	25	Both	Left, 1½ yrs. Right, 1 mo.	March, 1932	Labyrinthine complications	Dry ears
F. W.	9	Right	5 yrs.	March, 1932	Previous radical mastoid operation	90% dry
J. C.	9	Left	4 yrs.	April, 1932	Previous mastoid operation	Improved
M. G.	42	Right	35 yrs.	April, 1932	Previous radical mastoid operation	Practically dry
E. H.	22	Left	20 yrs.	April, 1932		Improved
				Children's Hospital Group		
J. S.	11	Both	5 yrs.	October, 1930	Long convalescence; acriviolet and ionization	Ears dry
H. P.	8	Both	8 yrs.	November, 1930 October, 1931	Attic operation repeated	Not improved
T. G.	11	Right	3 yrs.	November, 1930	Labyrinthine complication	Ear dry
E. L.	3	Right	10 days	January, 1931	History of intermittent discharge	Ear dry
M. A.	5	Left	7 wks.	January, 1931		Ear dry
S. B.	6	Left	2 wks.	April, 1931	Patient toxic, operation imperative	Ear dry
F. H.	6	Left	4 yrs.	August, 1931	Acriviolet; ionization	Not improved
M. G. (Wolff)	2	Left	4 mos.	August, 1931	Thick offensive discharge	Not improved
F. S.	8	Both	7 yrs.	August, 1931 October, 1931	Attic operation repeated	Not improved
N. N. (Luongo)	20 mos.	Both	14 mos.	August, 1931		Ears dry
J. F. (Luongo)	7	Right	1 yr.	September, 1931		Ear dry
J. N.	6	Left		October, 1931	Marked asthenia	Ear dry
M. A. (Wolff)	8	Right	2 yrs.	November, 1931		Ear dry
E. C. (Donnelly)	12	Right	3 yrs.	January, 1932	Marked polypoid granulations	Not improved
D. E. (Luongo)	3	Both	8 yrs.	February, 1932	Offensive discharge	Ears dry
R. M.	10	Both	8 yrs.	February, 1932	Operation on sinus also	Improved
R. P. (Wolff)	2	Both	1½ yrs.	February, 1932	Positional complication from fracture treatment	Improved
C. H.	7	Right	6 yrs.	January, 1932		Ear dry
F. F.	8	Right	3 mos.	March, 1932	Discharged dry; later recurrence	Not improved
R. G. (Heusen)	11	Both	2 yrs.	March, 1932	Pharyngeal complication	90% dry
P. C.	5	Both	Right, 1 mo. Left, 1½ mo.	April, 1932	Adenitis complication	Not improved
				Graduate Hospital Group		
G. K.	55	Left	2½ yrs.	April, 1931	Cholesteatomatous; ionization	90% dry
				Mary Drexel Hospital Group		
K. S.	6	Right	2 mos.	June, 1931	Labyrinthine complications; new membrane formed	Ear dry
A. S.	13	Both	4 yrs.	September, 1931	Hearing much improved	Ears dry
H. S.	5	Left	9 mos.	February, 1932	Preoperative labyrinthitis; acriviolet; ionization	Not improved
D. W.	13	Left	10 yrs.	March, 1932	Ionization	90% dry
R. M.	9	Right	3 wks.	April, 1932	Active mastoiditis	Not improved
				Office Group		
E. R.	38	Left	10 mos.	1929	New membrane	Ear dry
J. B.	35	Both	5 yrs.	1930	Previous mastoid in left ear	Ears dry
E. H.	21	Right	3 yrs.	1930	Cholesteatomatous; atrophic rhinitis	Ear dry
C. M.	47	Both	30 yrs.	1930	Tinnitus improved; new membrane formed	Ears dry
				Bryn Mawr Hospital Group		
R. S.	18	Left	4 yrs.	August, 1930	Cholesteatoma; hearing lowered	Ear dry
				Lankenau Hospital Group		
P. R.	33	Left	3 yrs.	June, 1928	Three recurrences	Ear dry
C. M.	40	Right	8 wks.	March, 1929	Formed new membrane	Ear dry
A. A.	45	Left	6 yrs.	May, 1929	Brief recurrence with influenza	Ear dry
M. W.	36	Both	5 yrs.	November, 1929	Hearing and tinnitus improved	Ears dry
R. V.	41	Right	3 mos.	March, 1930	Formed new membrane	Ear dry
S. M.	16	Both	10 yrs.	August, 1930	Occasional recurrence	Right ear dry; left ear improved
L. R.	74	Left	6 wks.	March, 1931	Active mastoiditis; major operation contraindicated	Ear dry
C. L.	15	Left	8 yrs.	September, 1931	Adenoids also removed	Ear dry
H. G.	13	Left	2 yrs.	November, 1931	Previous mastoid operation	Ear dry
F. B.	44	Left	40 yrs.	November, 1931	Preoperative labyrinthitis	Ear dry
S. D.	35	Left	5 yrs.	December, 1931	Preoperative labyrinthitis	Ear dry

had a recurrence. We have checked this up where feasible. The ears reported dry were dry when the patient was discharged or voluntarily withdrew from care, and, even if a few have slipped back, the ratio of success in ears which have obstinately resisted other treatment is sufficiently great to justify its trial.

Summary of Cases.—In the eighty ears operated on the following results have been obtained to date: (*a*) recovery with dry ears, 50, or 62.5 per cent; (*b*) practically dry at this time, 7, or 9 per cent; (*c*) improved ears, still pending, 9, or 11 per cent; (*d*) failures, no improvement, 14, or 17.5 per cent.

Group *b* represents ears that still carry a slight residual moisture, usually not recognized as such by the patient. The patients are convalescent, and the condition should soon clear up under proper care. Groups *c* and *d* need no further explanation.

Labyrinthine Complications.—Three patients with long continued suppurative otitis media had marked labyrinthine symptomatology with vertigo, falling, etc., prior to attic procedure. In two of these the condition has completely cleared up and in the other nearly so. Four patients had postoperative labyrinthine complications—in two the complications were quite transient (forty-eight hours) and the other two were rather seriously ill with nausea, vomiting and nystagmus for several days. Careful pediatric consultation handled the dehydration in one and the marked alkalosis in the other.

Borderline Mastoiditis.—Attic operations were performed in five cases in the hope of aborting an active mastoiditis, customary operation for which was undesirable from the patient's condition. In the six individual ears of this group, one-half, including those of a feeble man of 74 years, were successful. The remainder of the patients required operation on the mastoid later.

Continued Discharge After Radical Mastoid Operation.—A necessarily somewhat modified attic procedure was used in three cases in which there was obstinate discharge from the middle ear two or more years after previous radical mastoidectomy at other hospitals. In one a walled off cholesteatoma was removed from the mastoid cavity, and in another a polypoid mass was removed, both by the canal route. The ear in one of these cases is completely dry, and in the other two, in which operation was recently done, practically so.

A review of these results would surely seem to have justified this method. Treatment of some of these ears with reconstructed membranes, improved hearing and diminished tinnitus has given surprisingly successful results.

IV. STUDY OF PATHOLOGIC EARS FROM AUTOPSY

In concluding these studies on middle ear infection, we have reviewed a series of sections in a number of necropsy specimens, in the hope of obtaining information of value as to the behavior and transmission of infection in the middle ear. These middle ears were removed and sectioned by my associate, Dr. Wolff. Postmortem changes in an infant's ear make the pathologic interpretation difficult. One of the specimens demonstrates the course of the infantile chorda tympani nerve with remarkable clearness, another the so frequently faulty location of tympanic incision in acute middle ear infection; and the two following cases briefly outlined gave a rather unsuspected demonstration. Serial sections of the ear were made.

CASE A.—A child was admitted to the hospital after one week of a discharging right ear and a swollen bruise of the right temporoparietal region caused from a fall two days before; there was a parotid swelling on the same side. The ear was incised for further drainage. Five minutes after cleaning and incising the ear, the child had convulsive movements of the left side of the face and right leg for several minutes. Briefly reported, these convulsions increased in activity, frequency and duration until the child died five weeks later. Everything indicated that the original tympanic operation was responsible for the extension. In the interim, an operation on the right mastoid had been done but the mastoid area was found not much involved. At autopsy, a large subdural abscess was found in the right parieto-occipital area with several drachms of pus. No macroscopic connection between the middle ear or mastoid with the brain cavity was found. It was evident that the abscess came from the head injury.

CASE B.—A child entered the University Hospital in a semicomatose state, and a mastoid operation was performed by Dr. C. The history of meningeal progression will be omitted, and only the section findings of the ear presented. The dura over the petrous bone was macroscopically normal; when stripped, dehiscence was found in the bone over the mastoid excavation and along the internal auditory meatus. Sectioning of the petrous bone after removal showed direct extension of pus from the depth of the mastoid wound in toward the petrous tip. By following this in serial section, it was found to extend along the upper group of cells and became continuous with dehiscence at the internal auditory meatus.

CONCLUSION

An effort has been made in this paper to correlate studies in palliative methods, bacteriologic examination, routine blood examinations, attic operative work and necropsy section. As the theme implies, these are simply studies, and conclusions have already been incorporated in the discussion of each phase.

1912 Spruce Street.

ABSTRACT OF DISCUSSION

DR. JOHN RAYMOND HUME, New Orleans: My observations agree with Dr. Babbitt's in most instances. Probably because of the subtropical climate, the acute conditions observed in New Orleans would appear less virulent and it is obvious that the bacteriologic observations will be somewhat different. The hemolytic streptococcus was found much less frequently than in the series reported by Dr. Babbitt. During an epidemic of influenza during the early months of 1926, the hemolytic streptococcus was present in a great percentage of acute conditions of the ear, and many infections of the blood stream developed as a result of tardiness in resorting to mastoid drainage. This experience proved a stimulus to early and careful bacteriologic examination. Studies of the immature neutrophils has caused me to consider as of certain value the shift only as regards indications for diagnosis and treatment. Chronic aural infections seem to present the same picture in all clinics. It is well to emphasize the importance of patience in the preparation of the field of operation. Iodine powder is of value when applied to a properly prepared field but of no value when used before proper cleansing has been accomplished. This is true when the perforation is occluded by excessive granulations of polypi or when the tympanic membrane presents pin-point perforation. Dr. Applewhite, at the Eye, Ear, Nose and Throat Hospital, has shown that the chances of cure depend chiefly on ability to bring the ionizing fluid in contact with the diseased area in its entire extent. Dr. Babbitt reports 63 per cent recoveries with dry ears, from attic drainage, a procedure his series of cases shows to be relatively free from danger. If not successful in all cases it has provided a more accessible field for the institution of any routine measures that may be selected. The radical mastoid operation should be one of necessity rather than of choice. Attic drainage offers a safer procedure for the cure of these

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ears that otherwise would be submitted to the more radical operation. With chronically infected ears the time factor is usually not important. Frequent and painstaking cleansing, followed by routine treatment, should be attempted until its futility is assured. One is then justified in trying any safe surgical measure that improves drainage and provides accessibility to the area involved. These specifications seem to be met satisfactorily by attic drainage, as Dr. Babbitt recommends.

DR. A. G. FORT, Atlanta, Ga.: Dr. Babbitt's idea relative to lack of progress in treatment of progressive deafness coincides with my own, but I cannot agree that physicians are failing miserably in the treatment of acute and chronic middle ear infection. If one follows Tobey's contention and makes the incision a long one and at the position described by Dr. Babbitt, a very large percentage of patients will recover rapidly and little or no impairment of hearing will result. When this procedure alone has been followed, no case of chronic otitis or acute mastoid has occurred in my experience during the past two years. Let me emphasize his statement that many mastoids suggesting cloudy involvement by roentgen study do clear up. Practically every acute otitis media of more than thirty-six hours will show some cloudiness by roentgen examination. Dr. Babbitt strikes the keynote when he says that if the ear is to be opened, it should be done thoroughly and once for all. Let me emphasize his reference to attention to the nasopharynx, tonsils, sinuses and teeth. Success, so far as recurrences are concerned, is based largely on thorough attention. My experience with zinc ionization is that, when there is a persistent discharge after an acute condition, one or two treatments will cut short its duration. In tympanic conditions, when there is sepsis alone, cures can be secured in practically 100 per cent of cases within a very short time. The success is governed by one's ability to destroy granulations and polypi and then treat simple sepsis. A sufficiently large opening must be made through the tympanic membrane to give the solution access to the middle ear. Iodine powder is more easily used, the method of treatment being simple, and the types of otitis amenable to its therapeutic effects are practically the same as for ionization. I have never attempted the modified attic operation. The result in eighty cases tabulated by Dr. Babbitt is impressive. Its only drawback is that the work is done too much in the dark and I like to have a clear, dry field, good light and thorough vision when doing surgery in this region.

DR. J. A. BABBITT, Philadelphia: Dr. Hume is correct. Whether treating by iodine powder or by ionization, one must reach the field of operation. Powder blown against a small perforation does not reach the middle ear and will do no good. I use a long pipet, with an attachment that may be compressed like the bulb of an eye dropper. I place the powder against the perforation, and it can be quite easily forced through. There are no special instruments for this procedure. Some of them I adapted from Dr. Tobey's modified attic mastoid set. They are an assembled group and obtainable at any instrument house. This is a very simple procedure. It should not take more than five or ten minutes. The field is not bloody, except perhaps for a moment, and with a little suction it is easily cleared up for further work. This I think answers Dr. Fort's objection to a blind field. The field at the end of the instrument is perhaps a blind one, that is, in the neighborhood of the aditus ad antrum; but the rest of it is dry and I have not experienced any difficulty, using a large speculum, in seeing the field quite easily. I do not understand Dr. Fort's reference to my impression as to failures. I do have some failures in the attic operation. The operation is not undertaken until I feel sure that the ordinary palliative measures, routine cleansing, iodine and ionization, will not work. It is difficult to say whether that group marked as "not improved" would have been benefited by any other method short of a radical mastoid operation, and even that might not have been successful. But I do think that remarkable success is being achieved. The view of Harkness on iodine powder, published last December in the *Annals*, gave a fine composite of the opinion throughout the country, which was generally favorable. I think that physicians are succeeding well in handling these ears, with all the biochemical and laboratory aids at their disposal, and I think that some success is being made in progressive deafness.

LOCAL AGENTS THAT INCREASE TISSUE IMMUNITY IN SINUS MUCOSA

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Agents that are thought to act locally on the linings of the accessory sinuses, and thus affect the properties of immunity to disease which are inherent in such tissues in a state of health, will be discussed after brief consideration of those anatomic and pathologic factors that influence the choice and applicability of various classes of remedies.

Normal mucous membrane in the accessory sinuses is thin and pale, moistened by the moving film of mucus which is carried by ciliated cells to the ostium of each cavity.[1] This ciliated lining contains numerous goblet cells and the apertures of sinus glands lying in the loose submucosal connective tissue, which serves also as periosteum and contains a scanty network of slender blood vessels.[2]

Within the connective tissue are found a few round cells, and near the capillaries special staining methods will demonstrate an occasional histiocyte, or so-called "reticulo-endothelial" cell, capable of phagocytosis.[3] Inflammatory changes—exfoliation of epithelium, overgrowth of serous glands and edema of the subepithelial tissue—are the signal for mobilization of numerous histiocytes and plasma cells.[4] Following these protective elements, according to the type of irritant and duration of the irritative process, polymorphonuclear leukocytes and lymphocytes arrive in increasing numbers, and red cells may also be extravasated.

Such inflammatory changes lead to losses and metaplasia of ciliated epithelium and to the obliteration of the lumen of the sinus by infolded masses of edematous tissue. Interference with cleansing by ciliary action becomes complicated by alterations in the character of the normally defensive serous and mucoid secretion, which tends to accumulate and decompose along the irregular surface, escaping with difficulty from the swollen ostium of the sinus.[5]

While the normal sinus lining is sterile, and cleanses itself rapidly of introduced foreign matter, irritated mucoperiosteum invites bacterial invasion.[6] Various strains of bacteria may appear in the mucopus from the sinus at different periods, with remissions due to climatic changes, dietetic management, vaccine treatment or other general measures. Such recurrences, even after perfect healing of the most meticulous radical surgical procedures, wherein we now know that

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1. Hibbing, Anderson: The Physiology of Drainage of Nasal Mucus, Arch. Otolaryng. **15**: 92 (Jan.) 1932.

2. McMahon, B. J.: Histopathology of Sinusitis and Mastoiditis, Ann. Otol., Rhin. & Laryng. **38**: 732 (Sept.) 1929.

3. Fenton, Ralph A.: Noninfectious Factors in the Etiology of Sinus Disease, Ann. Otol. Rhin. & Laryng. **39**: 493 (June) 1930. A bibliography appears with this article.

4. (a) Fenton, Ralph A.: Immunity in Otolaryngology, Tr. Am. Laryng., Rhin. & Otol. Soc., 1931, p. 427. A bibliography appears with this article. (b) "Reticulo-Endothelial" Components of Accessory Sinus Mucosa, Arch. Otolaryng. **14**: 586 (Nov.) 1931.

5. Carmody, T. E.: Pathological Changes in the Nasal Accessory Sinuses, Tr. Am. Laryng. A., 1926, p. 185. Shambaugh, G. E., Jr.: The Basement Membrane in the Mucosa of the Upper Respiratory Passages, Arch. Otolaryng. **12**: 556 (April) 1931.

6. Linton, C. S.: Bacteriostatic Properties of Sinus Secretions, Tr. Am. Laryng., Rhin. & Otol. Soc., 1931, p. 200. Phillips, F. L.: The Rôle of Ciliated Epithelium in Sinusitis, Ann. Otol., Rhin. & Laryng. **35**: 709 (Sept.) 1926.

almost normal ciliated epithelium is reestablished in these cavities, are disheartening to the sufferer and his physician alike, and invite consideration of local agents which may help to increase the immunity of these tissues.

Shea[7] has recently pointed out that a person with healthy sinuses needs no artificial immunization against colds, and also suggests that the tonsillectomized person has to depend in some measure on the immune reactions furnished by his sinus mucosal surfaces.

Local measures directed toward these structures may roughly be divided into physical and chemical, and, from the pharmacologic point of view, into those modifying the surface tension of the cells composing sinus membranes and those manifesting—at least in vitro—bactericidal powers.

Cold applied locally—ice-bags and cold packs—has the time-honored antiphlogistic effect; of course, more, however, on the skin surfaces and sensory and sympathetic nerves than on the underlying sinuses. Many patients reject cold applications and complain bitterly of neuralgic increase; but, where the ethmoid or frontal may be threatening orbital invasion, local cold is often a valuable aid. Whether it does not, by slowing up access of blood to the inflamed area, impede the natural defensive mobilization somewhat, is an open question. Certainly, chilling is a big factor in stirring up acute sinusitis due to exposure.[8]

Heat externally applied has exactly opposite disadvantages; its congestive action brings in more immune cells and substances, to be sure, but produces more swelling as well. Thus, obstruction to drainage and increased pain may counterbalance any possible benefit to be derived from the added flow of blood. Herein lies the disadvantage of diathermy directed toward these membranes, boxed into stiff walls of bone. Swelling after diathermic treatment may lead to obstructive empyema of severe degree. Certainly, acute conditions demand great caution in its use. Whether the so-called "infra-red" heat lamps penetrate deeper than the skin, comfort from their careful use is certainly enhanced. But diathermic penetration is considerable, and demands expert management.[9]

Irradiation, advocated by Thost in 1913 for painfully healing sinus cases in which radical operation had been performed, and highly praised by Osmond and Ware in America, especially because of its shrinking effect on polypoid ethmoiditis, was attacked bitterly by Heidenhain in 1924 as being dangerous to closed cavities with bony walls. Esch reported numerous favorable results in chronic cases in 1927, but notes that roentgen therapy must not be used until several weeks after any acute attack.[10] He admits that dizziness persists twenty-four hours after irradiation of the frontal sinuses, and speaks of one case that required prolonged after-treatment of a dry pharyngitis. Certain roentgenologists have recently revived this method, using very careful dosage under aluminum screening. Care must be exercised by the roentgenologist in accepting the patient's statement of his case; nor will a roentgenogram be proper evidence of disease suitable for such treatment. Careful examination by the rhinologist should precede any roentgenologic treatment. In fact, since it is a known fact that roentgen rays are destructive to those lymphocytes that are most necessary adjuncts to mucosal healing, and since endarteritis and fibrosis are consequent on such exposure, it may be questioned whether irradiation is not in fact destructive rather than constructive.[11] If so, it cannot be considered as improving the immunity of sinus tissues. The action of radium on polypoid structures is well known; here again, destructive bombardment will be found to cause sequestration of turbinates and ethmoid septums.[12]

Methods of getting various liquids into contact with sinus mucosa depend on posture, after the gravity method of Proetz,[13] which should be preceded by shrinking and suction, and on syringe injection by cannula or needle. I need not go into the impossibilities involved in reaching every part of the mucosal surface of the accessory sinus—fronto-ethmoid cells, agger nasi cells and all the rest. It may be assumed, however, that entrance into the larger cavities—maxillary antrums, frontal and sphenoid sinuses—is rather readily effected. As a guide toward medication, consider what happens when various substances are applied to the normal antrum mucosa.

Gray, Gellhorn, McDonald and a host of biologic experts have established the fact that regulated osmotic interchange make it impossible greatly to alter the amount of water in the mammalian cell, and hence impossible to alter the diffusibility of its protoplasm.[14] The life functions of the most different types of cells are at their optimum if at least three salts—sodium chloride, potassium chloride and calcium chloride—are present in definite quantities. A fourth or fifth salt is needed for certain cell activities.[15] Ciliary activity is least inhibited by sodium sulphate, while sodium iodide is most poisonous to ciliary action. Curiously enough, sodium chloride inactivates ciliated epithelium, while an increase of ciliary activity, in diminishing amounts, is secured by salts of magnesium, barium, calcium, strontium, manganese, iron, cobalt, nickel, cadmium, lead, zinc, copper and uranium.

Gellhorn maintains that the increased permeability of the capillaries in inflammation is favored by calcium. It is impossible to increase the blood calcium without use of the parathyroid hormone, so that locally calcium salts will be found more valuable in securing diapedesis of necessary blood elements.

The highly astringent action of weak silver nitrate solution, and of the various dilutions of iodine with potassium or zinc iodide, render them rather undesirable except for postoperative use.[16] A wave of enthusiasm for chlorine, following the work of Dakin during the war, was followed by indignant protests from those to whose mucous surfaces chlorine proved a specific irritant.[17] Even in oil, its use in the nose was quickly

7. Shea, J. J.: Immunizing the Sinus Patient, South. M. J. **25**: 154 (Feb.) 1932.

8. Goldsmith, P. G.: The Diagnosis and Treatment of Inflammation of the Maxillary Antrum, Canad. M. A. J. **23**: 512 (Oct.) 1930.

9. Jones, A. C.: Therapeutic Application of Heat in Medicine and Surgery, M. Sentinel **38**: 231, 1930. Lewis, E. R.: General Principles Underlying Lateral Nasal Wall Surgery, Tr. Am. Laryng., Rhin. & Otol. Soc., 1925, p. 613.

10. Esch, H.: Röntgenbehandlung der Hämatome und entzündlichen Erkrankungen im Bereich der oberen Luftwege, Ztschr. f. Hals-, Nasen- u. Ohrenh. **18**: 255, 1927-1928.

11. Mittermaier, E.: Die Beeinflussung akuter Entzündungen durch Röntgenstrahlen, mit besonderer Berücksichtigung der Entzündungen in Schleimhäuten, Ztschr. f. Hals-, Nasen- u. Ohrenh. **18**: 260, 1927-1928.

12. Jarvis, D. C.: Roentgen Ray Therapy in the Non-Surgical Treatment of Ear, Nose and Throat Diseases, Tr. Am. Laryng., Rhin. & Otol. Soc., 1925, p. 474. McCullagh, S.: Radium in Polypoid Ethmoiditis, Tr. Am. Laryng. A., 1926, p. 30.

13. Proetz, A. W.: Displacement Irrigation of Nasal Sinuses, Arch. Otolaryng. **4**: 1 (July) 1926.

14. Gellhorn, E.: Lehrbuch der allgemeinen Physiologie, Leipzig, Georg Thieme, 1931, p. 23.

15. Gellhorn (footnote 14, p. 70).

16. Skillern, R. H.: Accessory Sinuses of the Nose, ed. 2, Philadelphia, J. B. Lippincott, 1916, p. 167.

17. Delavan, D. Bryson: Dichloramin-T Chlorcosane Solution in the Treatment of Infections of the Upper Air Passages, Tr. Am. Laryng. A., 1918, p. 293. Sperry, F. N.: The Treatment of the Common Head Cold, Tr. Am. Laryng., Rhin. & Otol. Soc., 1925, p. 311.

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given up. Compounds of the benzyl, salicyl and phenyl groups, fungicides and antiseptics offer certain advantages; they also stimulate defensive reactions in weak concentration, and are not unpleasant in taste and odor.[18] Here are included salicylic, benzoic acids and salts, thymol and phenol. Unfortunately, some require alcoholic solvents or must be put up in emulsion form.

Most important is the question of surface tension. Slightly hypertonic solutions in inflammation tend to abstract fluid from edematous mucosa; strong solutions destroy young cells which are attempting repair. Hypotonic solutions tend to abstract valuable salts from the tissues and impair mucosal resistance.

Colloidal solutions—gums and jellies, such as agar, acacia and tragacanth—have been found to be highly irritating to sinus mucosa because they inhibit ciliary action. Casein jelly and the oils are less irritating, and maintain medicinal substances longer in contact with the inflamed membranes. I have found that oils increase histiocyte mobilization somewhat, though by no means as much or as rapidly as on serous membranes—peritoneum and pleura.[19] The astringents—hydrastine and alum—are likely to prove irritating if used frequently.

Bactericidal action is outside the scope of this paper, but from the standpoint of assistance to immune reactions it may be said that Sluder's oil-phenol formula (0.25 to 0.5 per cent phenol in heavy liquid petrolatum) has proved of great assistance over many years past, especially in work on the sphenoid sinus.[20] My associates and I find mercurochrome 220-soluble, from 0.5 to 1 per cent—5 cc.—useful as an antrum antiseptic only for two or three washings at most. It seems irritating after that. Metaphen 1:5,000 may be used more or less indefinitely. Metaphen in oil by posture cannot be used more than a few weeks. Hexylresorcinol S. T. 37 (half strength) only occasionally has been useful in our experience. There are obvious objections to gentian and acriviolet in this field; less to the various silver proteins.[21]

Mass cultures of germs from the nose, grown in broth, filtered and killed by heat, have been injected in the accessory sinuses and also packed on gauze against the upper turbinates, after the method of Besredka.[22] Valuable for staphylococcic types of infection, useless for streptococci, these mass vaccines have the disadvantage of exposing the patient to an indeterminate amount of bacterial toxin, spread over a rather vascular area from which dangerous negative-phase symptoms of absorption have been reported. Because of the danger of sensitization to such bacterial toxins administered in uncertain amounts, this method can hardly be recommended, as pointed out before this section in 1925.[23] Accurate minimal subcutaneous dosage is preferable for the use of vaccines, in our matured opinion. Kolmer and his pupil, Amano,[24] have carefully checked this method with some favorable results; however, Kolmer last year denied the presence of bacteriophage in such "mass vaccines" and ascribed their immunizing results to improved phagocytosis. Moulonguet[25] stated that d'Herelle himself cannot always find a bacteriophage for sinus bacteria, and the former has abandoned the method after careful trial.

Choice of local therapeutic agents to increase tissue immunity in the mucosa of the nasal accessory sinuses should be restricted, in our judgment, to those that can readily be introduced into the affected region and that conform in chemical concentration and composition most nearly to the optimum for normal cell life. Mithoefer's classic formula—salt, calcium chloride and potassium chloride[26]—is excellent for this purpose, far better than salt alone. It has the disadvantage of slight milkiness, which masks small quantities of disintegrated pus in the wash water.[27] It is often surprising to note after three or four weeks of dreary lavage of the antrum, while ciliary regeneration has slowly gone on in spite of large amounts of pus every day, that rather suddenly the pus will disappear.[28] Here is a sign that normal physiologic conditions have been restored.

No two persons react alike to the oils and colloids. Allergic persons are perhaps among the most sensitive to all save isotonic cell-equilibrated chemical solutions.[29] It is necessary to study the patient as a whole, to decide whether he is suffering from an acid or alkaline excess, before accurate choice of local therapeutic agents can be laid down.[30] Nevertheless, a good general rule might be that those substances that are not destructive of newly activated cells by excessive concentration, and that favor tissue growth, rather than bacterial growth, and that are astringent rather than irritant, demulcent rather than caustic, will do most toward increasing local immunity in the accessory sinuses. After all, the defensive mechanism of the mucosal cell works as well against medicinal substances and agents placed in contact with it, as against toxic substances and foreign matter. Absorption through these mucosal surfaces is slight and slow, even for very powerful agents.[31] Local applications must therefore do their best work as cleansing agents, favoring removal of decomposition products, and, so far as possible, assisting in the healing of excoriated areas. It is too much to expect that surface applications can greatly modify the depths of an edematous membrane. Local measures, valuable in their place, must fit in to

18. Kingery, L. B., and Adkisson, Alva: Certain Volatile Oils and Stearoptens as Fungicides, Arch. Dermat. & Syph. **17**: 499 (April) 1928.

19. Fenton (footnote 4 *b*).

20. Sluder, G.: Nasal Neurology, Headaches and Eye Disorders, St. Louis, C. V. Mosby Company, 1927, p. 220.

21. Fenton, Ralph A.: Dyestuff Antiseptics in Rhinology, Tr. Am. Laryng., Rhin. & Otol. Soc., 1925, p. 394. Shea, J. J.: End Results of Sinus Surgery in Children, ibid., 1925, p. 174. Dean, L. W.: Infections of the Paranasal Sinuses in Infants and Young Children, Tr. Am. Laryng. A., 1918, p. 368. Hurd, Lee M.: Chronic Infections of the Nasal Accessory Sinuses, Ann. Otol., Rhin. & Laryng. **39**: 966 (Dec.) 1930. Wagner, W. A.: Diagnosis and Conservative Treatment of Sphenoid Suppuration, Tr. Am. Acad. Ophth, 1931, p. 208. A bibliography appears with this article.

22. Hays, H. M.: Local Immunization of Nose, Throat and Ear by Bacterial Vaccines, Arch. Otolaryng. **2**: 321 (Oct.) 1925. Novak, F. J., Jr.: The Besredka Theory of Immunity and Its Possible Application in Otolaryngology, Tr. Am. Acad. Ophth., 1930, p. 418.

23. Zingher, Abraham, in discussion on Hays (footnote 22).

24. Amano, K. W.: Pataasal Sinusitis: Local Immunization Treatment, Arch. Otolaryng. **14**: 30 (July) 1931.

25. Moulonguet and Doniol: Le traitement des sinusites maxillaires chroniques par le bactériophage de d'Herelle, Oto-rhino-laryng. internat. **10**: 65, 1932.

	Gm. or Cc.
26. Sodium chloride	26.37
Calcium chloride (dry)	21
Potassium chloride	10.6
Distilled water to make	1,000

25 cc. of stock solution to 500 cc. water should be used for antrum lavage.

27. Mithoefer, William: Lectures on Sinuology, Am. Acad. Ophth., 1931.

28. Harkness, G. F.: Some Observations on Sinus Disease in Private Practice, Ann. Otol., Rhin. & Laryng. **36**: 89 (March) 1927. Skillern (footnote 46).

29. Wenner and Nemours: The Influence of Calcium Combining Substances on the Maxillary Sinus Mucosa, Tr. Am. Laryng. Rhin. & Otol. Soc., 1931, p. 171.

30. (*a*) Stevenson, W.: Analysis of 192 Cases of Chronic Maxillary Sinusitis, Tr. Am. Laryng., Rhin. & Otol. Soc., 1930, p. 138. A bibliography appears with this article. (*b*) Lewis, E. R.: Analysis of 100 Consecutive Nasal Sinus Cases Treated Conservatively, ibid., 1930, p. 525. (*c*) McDonald, Leisure and Lenneman: New Principles in the Control of the Activity of Ciliated Epithelium, Tr. Am. Acad. Ophth., 1928, p. 319. A bibliography appears with this article.

31. Childrey, J. H., and Essex, H. E.: Absorption from the Mucosa of the Frontal Sinus, Arch. Otolaryng. **14**: 564 (Nov.) 1931.

a careful study of individual metabolism.[32] Too often the sufferer from accessory sinus diseases is suffering from lowered resistance which is due to causes not at all local in origin. It is folly to expect increased immunity from purely local measures, whether physical, medical or surgical, unless the general or constitutional basis is altered for the better.[33]

ABSTRACT OF DISCUSSION

DR. ARTHUR W. PROETZ, St. Louis: I should like to present another factor in the immunity of the upper respiratory tract which I believe has not been suggested before, namely, the surface charge of the nasal mucosa, not as it affects the permeability of the membrane but as it produces an absorption of bacteria, dust and other minute particles as they pass through the nasal chamber. The static surface charge of the body, generated by friction with clothes and surrounding objects, is sufficient to cause the adherence of small particles to the body surfaces, including the upper respiratory mucosa. This is especially true in winter, when the humidity is low. In order to demonstrate the adsorptive effects of this current, two aluminum plates were arranged in such a manner that one was separated from the other by an interval of 1 cm. by a bakelite rod. Cigaret ashes were scattered on the lower plate. When one now touched the upper plate, after crossing the room, the ash bridged the gap of 1 cm. and clung to the upper plate. The phenomenon varied with the humidity. The intensity of this current was then studied by means of the string galvanometer. It was found that while there were some momentary differences in potential between the pharyngeal mucosa, for instance, and the cheek, they were in the main alike and were of the order of 2 milliamperes. When one walked about the room, the pharyngeal current often became negative and it was thought that possibly breathing affected a discharge which might maintain the potential of the upper respiratory tract at a lower level than the rest of the body, thus possibly affecting its permeability. This idea was proved to be erroneous. Discharges after holding the breath for twenty seconds were identical with those recorded after breathing heavily for a like period. It was shown that the ordinary motions of walking, turning about and sitting down keep the mucosal surfaces constantly at a varying potential, usually positive. From the reaction of the cigaret ash to this surface charge it would seem that a similar phenomenon occurred in the nasal vestibule toward dust and bacteria, since these are known to be negatively charged. Lycopodium powder was dyed with a minute quantity of methylene blue dye, and while methylene blue is known to carry a positive charge, the resulting powder still reacted negatively to the aluminum plate. This powder was now inhaled while the body was charged, and again while it was grounded. It was impossible to control the amount of powder to such an extent that a line of demarcation could be made out in the nose, but no powder appeared in the pharynx while the charge experiments were going on. With the body grounded, the powder appeared in the pharynx, strangely enough on the lateral lymphatic bands and no other place. Much evidence must still be accumulated. I desire merely to point out that body surface charge is in a measure responsible for filtering inspired air in the anterior part of the nose.

DR. HUGH L. MCLAURIN, Dallas, Texas: The diagnosis of sinus disease with the aid of the x-rays and opaque mediums has advanced to a high degree of accuracy, and the surgical technic and procedures for handling sinus disease have become quite generally standardized. Future progress cannot be expected to come so much from these factors. All are sadly cognizant of the fact that the surgical care of sinus disease leaves much to be desired. As satisfactory results are obtained and as much relief is afforded by surgical treatment of sinus conditions as is obtained by surgery in other parts of the body, but at the best it simply is a relief measure and cannot afford a cure. If it is possible to build up the mucosal immunity by local or general measures, much sinus trouble can be prevented or relieved and probably a great deal of surgery avoided. The first line of cellular defense in the mucosa comes from the histiocytes, which originate in the reticulo-endothelial system. These cells increase tremendously at the site of any injury to the mucosa, or in the presence of any invading organism that may break down the integrity of the membrane. Before this becomes necessary the membrane must be invaded by organisms of such virulence and under such favorable conditions that the protective power of the ciliary action and mucinous coating of the membrane is broken down. The ciliary action of the normal mucosal epithelium affords a protection which in itself is marvelous, and any local measure for the increasing of sinus resistance must meet the requirements of stimulating or at least impeding ciliary action and of cleansing the mucosa to make this ciliary action more effective, and must produce a histiocytosis. Although Dr. Fenton has detailed the effect of many agents on the sinus mucosa, it is difficult to see how any great practical help can be expected from such measures. I have tried most of the practical things in the pharmacopeia, but I have never seen, with few exceptions, any very helpful effects.

DR. ROBERT F. RIDPATH, Philadelphia: It must be realized that there are other factors besides local agents which must be considered in order that local agents may perform the functions that are expected of them. The cilia will not act unless the system is in the proper condition and the blood stream has certain elements in the proper proportion in it. That seems to be the fundamental principle on which we must proceed to do this scientific work along biochemical lines. Dr. Fenton mentioned calcium; he also spoke of iodine. Now the calcium content of the blood does not give any index of what really is occurring in the system. Calcium increases the activity of the cilia, but one may see a person whose resistance is lowered and in whose body the amount of infection is known but the calcium content is normal, and yet one knows that this person is lacking in calcium in the system in some manner. There are four elements in the system which seem to have a relationship one to the other, but in certain conditions these relationships all show a change. The calcium content of the blood is, say, 9.05. This varies little. The report in the beginning from the biochemist will show that this is the normal calcium content, and yet the actual amount of calcium that is being used in the blood is decidedly reduced. To get the real amount of the blood calcium that is being used, it must be filtered, and in filtering the calcium one finds that approximately half is nonfiltrable; also that the filtrable part that is supposed to remain in the body as calcium must be divided into two, diffusible and nondiffusible, so that with the ratio of 9.05 only 2.02 is being used.

DR. RALPH A. FENTON, Portland, Ore.: I am grateful for these remarks, and especially for the record of experiments on surface charges, brought by Dr. Proetz. I purposely avoided going into electrical reactions, because that would enter the realm of biochemistry; and the biochemists are wandering in a rather thick fog. However, what Dr. Ridpath brings out regarding these differences in the active life of the cell, possibly due to electric charges, points the way to work that may be of practical value.

32. Lewis (footnote 30 *b*).
33. Draper, George: Disease: A Psysomatic Reaction, J. A. M. A. **99**:1281 (April 21) 1928. Stockard, C. R.: Constitution and Type in Relation to Disease, DeLamar, Johns Hopkins University, Baltimore, Williams & Wilkins, 1925-1926, p. 154.

Play Hunger in Adolescents.—The teaching profession in this country is still dominated by the tradition that education is an operation performed on the mind alone. The majority have a most inadequate conception of the part the body plays in it. They know, of course, that the body must be kept in health and needs exercise. But very few of them have grasped the fact that the body needs positive education, a very different thing from mere exercise, as well as the mind, and that unless you educate the two together your education of either is bound to fail of its best results. They know that children must be sent out into the playground to kick up their heels and play games; . . . but only a minority are aware that the play hunger of the young human animal is one of the most valuable forces the educator has to work with, and that under skilful guidance it may bring an immense reinforcement to his mental and moral development.—Jacks, L. P.: The Liberal Education of the Body, *Lancet* **2**:1147 (Nov. 26) 1932.

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SENSITIVITY TO ACACIA

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The beneficial results of acacia injected intravenously in combating hemorrhage and surgical shock have been demonstrated experimentally and clinically by Bayliss,[1] Rous and Wilson,[2] Mann,[3] Keith [4] in association with the British Shock Committee, Randall,[5] McIndoe [6] and others. Huffman,[7] in 1929, reported its use in 300 cases at the Mayo Clinic and confirmed its therapeutic value in shock. Anaphylactoid reactions [8] which followed its first injection during the early work with acacia were shown to be the result of impurities in the solution, and untoward effects were not observed with properly prepared solutions.

Reports of true anaphylactic reactions following its use have not been found in a review of the literature. Bayliss was unable to produce anaphylactic shock with acacia in cats and guinea-pigs, and De Kruif concluded that solutions of acacia were harmless so far as anaphylactic effect is concerned. Theoretically, because of its chemical inertness, acacia should be innocuous. However, the methods of collection and preparation of acacia allow inclusion of a variety of extraneous substances, and it is possible that the persistence of these substances in the final solutions might result in production of anaphylactic antibodies in the recipient.

About 3,000 injections of solution of acacia have been given at the Mayo Clinic, some of the patients receiving two or more injections. These injections have been given within a few days, and only one case has been found in which the interval between the first and the second injection was long enough for the development of anaphylactic sensitiveness if such sensitiveness could develop at all. Since hemorrhage or shock constitutes the chief indication for the use of acacia, it is unlikely that more than an occasional patient will require a second injection at some later date.

The following report of a case and experimental data are presented to show that sensitiveness to acacia, or to some substance in solution of acacia, may occur if the acacia is given some time after a previous sensitizing injection of the same substance.

REPORT OF CASE

An unmarried woman, aged 27, following a Kondoleon operation for elephantiasis of the right leg, March 27, 1931, received 500 cc. of a 6 per cent solution of acacia and 500 cc. of physiologic solution of sodium chloride intravenously. No untoward reaction occurred, and the patient's convalescence was normal. Oct. 27, 1931, a second Kondoleon operation was performed, and immediately following operation she was again given intravenously 500 cc. of solution of acacia and 500 cc. of physiologic solution of sodium chloride. Soon after the injection was started, she complained of nasal obstruction and lacrimation. Gradually slight difficulty in breathing developed, with cough, loss of voice, and a suggestion of laryngeal stridor. The reaction was not severe, and after administration of epinephrine, 5 minims (0.3 cc.), the symptoms rapidly disappeared. No cutaneous symptoms were noted, and except for slight huskiness, which lasted for several hours, the patient was free from symptoms within an hour.

On questioning, it was learned that the patient's mother had had hay fever in her girlhood, but there was no other known allergy in her family, although the patient and her brother had been treated occasionally for "sinus trouble." One month after the last injection of acacia, cutaneous tests were made with acacia in dilutions of 1 to 1,000, 1 to 100 and 1 to 10, with negative results. Tests for sensitiveness to pollens and animal danders were negative, with the exception of a questionably positive reaction to dog hair.

EXPERIMENTAL WORK

In order to test the possibility of animals becoming sensitive to acacia, the following experiments were performed as shown in the accompanying table.

Summary of Experimental Work on Anaphylaxis from Given Acacia

Animal	Injections of Solution of Acacia (10 Cc.) Intraperitoneally Before Testing	Shocking Dose, Given for Test, Cc.	Method of Administration of Shocking Dose	Anaphylaxis (Graded 0 to 4)
1	4	0.5	Intravenous	*
2	4	0.5	Intravenous	*
3	4	0.5	Intracardial	2
4	4	0.5	Intracardial	*
5	4	0.5	Intraperitoneal	1
6	4	0.5	Intraperitoneal	0
7	4	0.5	Intraperitoneal	0
8	4	0.5	Intraperitoneal	1
9	4†	0.5, 0.0‡	Intravenous	0
10	4†	0.2, 1.0‡	Intravenous	0, 2
11	4†	0.2	Intravenous	0
12	4†	0.2, 1.0‡	Intravenous	0
13	5§	0.2, 1.0‡	Intravenous	0
14	4§	0.2, 1.0‡	Intravenous	1, 0
15	1§	0.5	Intravenous	0
16	1§	0.2, 1.0‡	Intravenous	2, 1
17	1§	0.3	Intravenous	3
18	1§	0.2, 1.0‡	Intravenous	1, 4
19	1§	0.4	Intravenous	4

* Animal died.
† 0.5 cc. administered intravenously one week previous to beginning the intraperitoneal doses; one dose of acacia was buffered to *p*H 6.6.
‡ Second dose was administered thirty minutes after the first dose.
§ One dose of acacia was buffered to *p*H 6.6.

1. Six normal rabbits, 12 weeks old, were each given 50 cc. of solution of acacia intravenously, Nov. 4, 1931. This dose was repeated, November 9, 16 and 21. After an interval of four weeks after the last injection, each rabbit was given a dose of 2 cc. of acacia intravenously. These animals were observed for one hour following this injection and during that time none exhibited any abnormal symptoms. On that day one of the rabbits was given 2 cc. of a 50 per cent egg white solution intravenously in order to see whether such a dose of a foreign protein would render it more sensitive to acacia. Three weeks later this animal was given 2 cc. of acacia intravenously, and three weeks after that, 15 cc. of acacia intravenously, but it did not manifest any signs of anaphylaxis on either occasion.

2. Eight normal 300 Gm. guinea-pigs were each given 10 cc. of acacia solution intraperitoneally, Nov. 4, 1931. This dose was repeated, November 9, 16 and 21. After four weeks had elapsed, two of the guinea-pigs were each given 0.5 cc. of acacia intravenously. Both animals, after about thirty seconds, exhibited typical anaphylactic reactions, manifested by sneezing and coughing, scratching their noses with their paws, and at length signs of dyspnea. After about three minutes of these manifestations, both pigs died. Two others received 0.5 cc. of solution of acacia intracardially, and both

From the Division of Medicine and the Section on Clinical Pathology, the Mayo Clinic.

1. Bayliss, W. M.: Intravenous Injection in Wound Shock, New York, Longmans, Green & Co., 1918.
2. Rous, Peyton, and Wilson, G. W.: Fluid Substitutes for Transfusion After Hemorrhage, J. A. M. A. **70**: 219-222 (Jan. 26) 1918.
3. Mann, F. C.: Experimental Surgical Shock, Am. J. Surg. (Anesthesia Supplement) **34**: 11-15 (Jan.) 1920.
4. Keith, N. M.: Reports of the Special Investigation Committee on Surgical Shock and Allied Conditions: IX. Blood Volume Changes in Wound Shock and Primary Hemorrhage, Special Report Series 27, Oxford University Press, 1919.
5. Randall, L. M.: Shock in Obstetrics: Treatment with Intravenous Injection of Acacia, Tr. Sect. Obst., Gynec. & Abd. Surg., A. M. A., 1929, pp. 141-148.
6. McIndoe, A. H.: Prolonged Intravenous Administration of Gum Acacia-Citrated Blood Sequence During Severe Intracranial Operations, Proc. Staff Meet., Mayo Clin. **4**: 52-53 (Feb. 13) 1929.
7. Huffman, L. D.: Solution of Acacia and Sodium Chloride in Hemorrhage and Shock, J. A. M. A. **93**: 1698-1701 (Nov. 30) 1929.
8. De Kruif, P. H.: Experimental Research on the Effect of Intravenous Injection of Gum Salt Solutions, Ann. Surg. **69**: 297-311 (March) 1919. Hanzlik, P. J., and Karsner, H. T.: Anaphylactoid Phenomena from the Intravenous Administration of Various Colloids, Arsenicals and Other Agents, J. Pharmacol. & Exper. Therap. **14**: 379-423 (Jan.) 1920.

manifested milder signs of anaphylaxis; one animal recovered and the other died after one hour. The remaining animals were given the same amount intraperitoneally, and two exhibited mild reactions; the others, no symptoms at all.

3. In order to test the possibility that the intravenous method of injection was responsible for the death of the animals, Jan. 12, 1932, four normal guinea-pigs were each given injections intravenously of 0.5 cc. of solution of acacia. No deleterious effects were noted. On the same day, eight other normal guinea-pigs were each given 10 cc. of acacia intraperitoneally. Four of these died from peritonitis within five days after the injection. January 19, the four remaining animals and the four that had been given intravenous injections were each given 10 cc. of solution of acacia intraperitoneally, and four new guinea-pigs were also so treated. Of the latter four, two died within four days from peritonitis. January 26, the remaining ten animals in these three series were each given 10 cc. of acacia intraperitoneally; the next day, four of these died of peritonitis.

The number of deaths due to peritonitis demonstrated the effect of irritation caused by solutions of acacia when injected into the peritoneum. The solutions were sterile, and no injury was done to the bowels at the time of injection. It was thought that since the acacia was acid, p_H 4.4, perhaps this fact explained the irritating effect. February 2, five normal guinea-pigs were therefore given intraperitoneal injections of 10 cc. of citric acid-phosphate buffer of a p_H of 4.4, and at the same time the six remaining animals were given 10 cc. of solution of acacia. None of the animals died of peritonitis. February 10, these six animals and the five which received the buffer solution were each given 10 cc. of acacia intraperitoneally, the acacia being previously buffered to a p_H of 6.6. None died. March 9 the eleven remaining animals were tested for sensitivity to acacia by intravenous injection of solution of acacia.

Animals 9, 10 and 11 had each received, at approximately weekly intervals, 0.5 cc. of acacia intravenously, followed by four doses of 10 cc. each given intraperitoneally.

After four weeks, animal 9 was given 0.5 cc. of acacia intravenously and manifested no symptoms. After thirty minutes, a dose of 0.9 cc. was given with the same result. Animal 10 received 0.2 cc. and exhibited no symptoms. After thirty minutes, 1 cc. was given, with moderately severe symptoms of anaphylaxis; the animal recovered after about fifteen minutes. Animal 11 received 0.2 cc. and showed no symptoms.

Two animals, 12 and 13, after receiving four and five intraperitoneal injections of acacia, respectively, were each given, after four weeks, test doses of 0.2 cc., and after thirty minutes, 1.0 cc.; neither exhibited any symptoms.

Guinea-pig 14 received four intraperitoneal injections of acacia and when given 0.2 cc. intravenously after four weeks had elapsed, exhibited mild anaphylatic symptoms. After thirty minutes a dose of 1 cc. produced no further effects.

The results of giving acacia intravenously to the five animals which received but a single dose four weeks previously were as follows: Animal 15 received 0.5 cc. and no symptoms developed. Animal 16 received 0.2 cc., and moderately severe anaphylaxis developed immediately; in thirty minutes another dose of 1 cc. produced milder symptoms. Animal 17 received 0.3 cc. and severe symptoms developed and persisted for forty-five minutes. Animal 18 had mild symptoms after a dose of 0.2 cc., and thirty minutes later extremely severe symptoms developed from a dose of 1 cc. Extremely severe symptoms developed in animal 19 after a dose of 0.4 cc. Both of these last two animals appeared so acutely ill that it did not seem as though they could recover. Both remained ill for several hours after the injections had been given.

Of the nineteen guinea-pigs tested after sensitization with acacia, in seven no symptoms of anaphylaxis developed, in four mild symptoms, in three fairly severe symptoms, in two extremely severe symptoms, and three died. One of the animals died three days after the intravenous test and at necropsy exhibited acute peritonitis superimposed on old healed peritonitis. This animal had shown no anaphylactic symptoms.

It is evident that although rabbits do not become sensitized to acacia under the conditions of the experiments, guinea-pigs do, and even one dose of acacia may produce a state of sensitivity. The degree varies, and not in all does such sensitivity develop; but some are so severely sensitized that a relatively small dose may produce death.

Peritoneal irritation is great after sterile acacia is injected into the peritoneal cavity, but this is probably not due to its acidity.

SUMMARY

Although solution of acacia has been repeatedly demonstrated to be extremely useful and beneficial, one must bear in mind the fact that under certain unusual conditions anaphylactic sensitivity to it may develop. Solution of acacia is a mild antigen; rabbits do not exhibit any symptoms from its repeated injection. Also, anaphylactic symptoms did not develop in 37 per cent of guinea-pigs in experiments designed to cause such symptoms. The literature contains no reference to acacia possessing anaphylactic properties, although in the earlier reports some types of anaphylactoid reactions were recorded following a single injection of solutions of acacia when there was some question as to the purity of the solution. It is possible to cause anaphylaxis in guinea-pigs properly prepared by suitably designed experiments along standard lines of procedure with acacia solution. There is no danger in the first dose of acacia if the solution is properly prepared, but subsequent doses, given after an elapsed time of at least three weeks, should be given cautiously because of the possibility of anaphylactic reactions.

PERIARTHRITIS OF THE SHOULDER

AN ANALYSIS OF TWO HUNDRED CASES

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In an effort to elucidate the relationship of trauma, foci of infection and metabolic factors in the etiology of periarthritis of the shoulder and to determine the most efficacious treatment for this condition, we have analyzed a series of 200 cases that have come under our care during the last nine years. We realize that we may be treading on thin ice when we use the term "periarthritis of the shoulder," but it appears to us that this better describes the clinical entity than "painful shoulder," "subdeltoid bursitis," "subacromial bursitis" or "calcifications of the supraspinatus tendon," with which names all are familiar. Although Codman,[1] in his classic thesis of this subject, suggested the name "subacromial bursitis," he later demonstrated that when calcification occurred, the deposit was in the tendon of the supraspinatus muscle. This finding was confirmed by Brickner,[2] Carnett[3] and others. Calcification, how-

From the Cleveland Clinic.
Read before the Section on Orthopedic Surgery at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 11, 1932.

1. Codman, E. A.: On Stiff and Painful Shoulders, Boston M. & S. J. **154**: 613, 1906. Bursitis, Subacromialis and Periarthritis of the Shoulder Joint, ibid. **159**: 533; 576; 615; 723; 756, 1908; Complete Rupture of the Supraspinatus Tendon—Operative Treatment, ibid. **164**: 708, 1911; The Stiff and Painful Shoulders (as Explained by Subacromial Bursitis and Partial Rupture of the Tendon of the Supraspinatus), ibid. **165**: 115, 1911. Abduction of Shoulder: An Interesting Observation, ibid. **166**: 890, 1912.

2. Brickner, W. M.: Prevalent Fallacies Concerning Subacromial Bursitis, Its Pathogenesis and Rational Operative Treatment, Am. J. M. Sc. **149**: 351, 1915; Pain in the Arm: Subdeltoid (Subacromial) Bursitis, J. A. M. A. **69**: 1237 (Oct. 13) 1917.

3. Carnett, J. B.: The Calcareous Deposits of So-Called Calcifying Subacromial Bursitis, Surg., Gynec. & Obst. **41**: 404 (Oct) 1925; Calcifying Subacromial Bursitis, Radiology **17**: 503 (Sept.) 1931.

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ever, does not explain the whole pathologic picture. An analysis of the reports of Codman,[1] Brickner,[2] Carnett [3] and Harbin [4] shows that even with excision of the bursa or removal of calcified bodies, further adhesions must be broken by manipulation before the arm can be brought into abduction and external rotation. It would appear, therefore, that we have a complex pathologic state in which the capsule ligaments and tendons about the shoulder joint are involved.

Periarthritis of the shoulder is a distinct entity and presents a clinical syndrome that is more or less constant. The complaints are largely of pain and loss of function. The patient relates a history that he has developed pain in his shoulder either with or without an injury. The pain may be characterized by aching with sharp, stabbing pain in certain limited motions, or it may be so severe that morphine is required for its control. The pain usually is felt a few inches above the insertion of the deltoid and often continues in the nature of a neuralgia down the outside of the arm to the hand. There is no alteration in sensation or in the reflexes, and the nerve trunks are not tender on palpation. The limitation of motion in periarthritis of the shoulder is quite characteristic. Abduction is possible to about 45 degrees; rotation, both internal and external, is possible to about 50 per cent of normal, while forward and backward movement is not limited and is painless. In some cases abduction is painful only when the arm is passing through the arc from 70 to 90 degrees, while abduction beyond the right angle can be accomplished without discomfort. There is a similar experience when the arm is lowered. Usually there is little change in the contour of the shoulder, but atrophy, both in the deltoid and supraspinatus regions, is present in the chronic cases. Except in the very acute cases, muscle spasm does not occur until the movements are checked by painful adhesions.

Only cases showing this typical clinical syndrome were used for this analysis. The only joint symptoms were limited to the shoulders, and no cases in which there was associated multiple arthritis were considered. All cases of periarthritis of the shoulder following definite dislocation, fractures about the shoulder or complete tearing of the supraspinatus tendon after severe injuries as described by Codman,[1] purposely were omitted from this study. It was felt that the elimination of these cases in which definite tearing of the joint structures had occurred would furnish a uniform group of cases with typical clinical findings, in which there still exists much doubt as to the etiology.

TABLE 1.—*Analysis of Two Hundred Cases*

Total number	200
Number showing calcium by roentgen examination	73
Number of males	96
Number of females	104
Age incidence	
11 to 20	2
21 to 30	10
31 to 40	25
41 to 50	61
51 to 60	67
61 to 70	32
Over 70	3
Number in right shoulder	103
Number in left shoulder	84
Number in both shoulders	13
Calcium deposits, right	45
Calcium deposits, left	25
Calcium deposits, both	3

4. Harbin, Maxwell: Deposition of Calcium Salts in the Tendon of the Supraspinatus Muscle, Arch. Surg. **18**:1491 (April) 1929.

The clinical picture is that of the patient who presents himself with the typical disturbance in the shoulder and who gives a history of no injury, or if there has been injury, one such as "excessive work in the garden," "washing windows," or a slight twist after "throwing a baseball" or "playing golf" is given as a causative factor of his disability. In these cases there is always a question as to whether or not the alleged accident had anything to do with the condition found in the shoulder.

TABLE 2.—*Analysis of Two Hundred Cases of Periarthritis of the Shoulder*

Number of cases reported				200
Number showing calcium (36.5%)				73
		Without Calcium	With Calcium	Total
Injury (67)	Injury only	11	6 (24.7%)	17
	Injury and infection	36	14 (28%)	50
Infection (176)	Infection only	59	37 (38.5%)	96
	Infection and metabolic	17	13 (43.7%)	30
Metabolic problems (32)	Metabolic only	1	1	2
No demonstrable cause (5)		2	3	5
Analysis of metabolic disturbances				
Hyperthyroidism		10	8	18
Hypothyroidism		4	3	7
Diabetes		4	3	7

In all cases in this series the thorough routine examination included a roentgenogram of the involved shoulder, detailed search for foci of infection, routine blood and urine examination and whatever special tests were indicated.

These patients have been followed from one to nine years, and we have made contact with all the patients within the last four months in order to complete the record of the length of time under treatment, subsequent developments and ultimate results.

Our study has shown us that the clinical syndrome is not influenced in any respect by the presence or absence of calcium deposits as demonstrated roentgenologically. The presence of calcium is no indication of the severity or the duration of the symptoms. These deposits have been found in shoulders that have had no symptoms and have persisted in others after all symptoms have disappeared. Analysis of table 1 indicates that calcium deposits occur in 36.5 per cent of cases, or approximately one in three.

Periarthritis is found as often in males as in females and appears after the age of 40 years in over 80 per cent of the cases. The right shoulder is involved more frequently than the left, and the disease is often bilateral.

Table 2 shows that of the 200 patients with periarthritis of the shoulder, only 67 gave a history of trauma. However, in fifty of these, examination revealed some focus of infection or toxic element that might have been a contributing factor. Of the total number, 176, with focal infections, 50 had had some trauma, 96 showed only a focus of infection and in 30 there were also definite metabolic irregularities. In two, metabolic abnormalities only were found, while in five no etiologic factor could be elicited.

This analysis indicates that foci of infection and glandular dysfunction would appear to be much more important than trauma as etiologic factors, although it is extremely difficult to evaluate their true significance. Calcium deposits are found in approximately the same percentage in all the groups regardless of whether trau-

matic, infectious or glandular factors predominated, which shows that there is some common underlying alteration in the physical state that must determine the deposition of calcium. Brickner,[2] in 1917, suggested some metabolic fault as an etiologic factor. Nevertheless, whatever the general factors, there must be some local disturbance which predisposes to the formation of these calcium deposits about the shoulder.

The pathogenesis of the calcareous deposits in the supraspinatus tendon is not understood, but it was suggested by Moschcowitz [5] that it is traumatic. He felt that the trauma was due either to injury to the supraspinatus tendon by impingement on the acromion or frequently repeated traumas to the supraspinatus tendon by contraction of the muscle. We are inclined to favor the latter view. The impingement theory would appear to be inadequate because the shoulder girdle is so freely mobile. The supraspinatus tendon, attached as it is to the short end of a long, widely moving lever represented by the arm, makes it subject to frequent and repeated traumatisms. This trauma may produce small areas of necrosis of the tendon resulting in calcareous infiltration. However, we have no satisfactory explanation to account for the fact that such changes are limited to this particular tendon and that they are not found elsewhere.

Method of applying gradual abduction and external rotation with traction. The support for the traction weight is fastened to that part of the bed which can be elevated. This maintains position of the arm when the patient is sitting or lying and facilitates the application of local treatment to the shoulder.

These calcareous deposits vary in consistency and are reported to be composed of calcium, phosphate and carbonate. Harbin [4] reported the chemical analysis of the material removed in one of his cases as consisting of fat, protein and a fair amount of calcium phosphate. Stern [6] reported three cases in which he felt the deposit was an amorphous fat. McCullagh,[7] biochemist, who made an analysis of the cheesy material from one of our cases, reported that there was sufficient calcium to account for the roentgen shadow but not sufficient phosphate or carbonate to account for the calcium in the form of these salts. The deposit was soluble in ether and had a somewhat fatty appearance, and he felt that it probably consisted of a calcium soap.

5. Moschcowitz, E.: Histopathology of Calcification of the Supinatus Tendons Associated with Subacromial Bursitis, Am. J. M. Sc. **150**: 113 (July) 1915.

6. Stern, W. G.: Metamorphosed Fat Deposits in Subdeltoid Bursitis, Surg., Gynec. & Obst. **46**: 92 (Jan.) 1928.

7. McCullagh, D. R.: Personal communication.

TREATMENT

The treatment of periarthritis of the shoulder has been approached from two angles—general treatment of the patient and local treatment of the shoulder.

The general treatment consisted in removal of all foci of infection, in the teeth, tonsils and prostate, and in every way attempting to bring the patient to a normal state of metabolism. The importance of treating the general metabolic condition of the patient was strikingly emphasized during the observation of several cases of periarthritis of the shoulder in patients who were being treated for severe hyperthyroidism. The results of treatment of the local condition in the shoulders by the various forms of physical therapy and the preoperative regimen, which included complete rest in bed and the administration of compound solution of iodine, were extremely disappointing, and the patients failed to manifest anything but mild improvement. On the other hand, after thyroidectomy there was almost invariably extremely marked relief of the joint symptoms within from forty-eight to seventy-two hours. The intense pains subsided rapidly and with further use of physical methods there was a complete return to normal function. Both hyperthyroidism and hypothyroidism have been encountered in our series of cases; the first was treated by operation and the latter with thyroid extract. Coincident hyperglycemia has been corrected by means of a typical diabetic regimen. Dietary regulation was insisted on and unless contraindicated the patients were given a high vitamin, low carbohydrate diet. Heliotherapy has proved extremely beneficial. Several of our patients showed little improvement with local measures until they acquired a coat of tan.

The local treatment has varied somewhat according to the severity of the symptoms, but the following is a typical regimen to which our patients are subjected. During the acute stage with severe pain and possibly muscle spasm, rest of the shoulder, preferably in bed, is advised. Traction is applied both above and below the elbow and the arm is fixed in moderate abduction and external rotation. As the acute symptoms subside the arm can gradually be brought to the degree of abduction desired. We have found that the position of full abduction and external rotation recommended by many has no particular advantage and is likely to add to the patient's discomfort. Ice caps are applied to the shoulder. Cold applications are more efficacious in the acute stage as any form of heat seems definitely to increase the pain. On the third day sedative diathermia is given and the arm is passively moved (once only) through the full range of abduction and internal and external rotation and is then fixed again in the original position. This treatment must be carried out cautiously, for if motion is started too soon it will increase the reaction about the joint. On the other hand, if the arm is kept too long in fixation the exudate becomes organized with the formation of adhesions. The foregoing treatment is carried out daily and voluntary contraction of the deltoid and other muscles is encouraged to the point of pain. The voluntary exercises are facilitated by using the traction apparatus instead of a cast. These movements are beneficial while move-

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ment beyond this point, either active or passive, is detrimental. In the subacute cases the arm is protected on an abduction splint, and the patient is given treatment with diathermia, usually on alternate days, and voluntary exercises are encouraged daily.

As the range of voluntary movement without pain increases, the degree of passive abduction is gradually increased until full active abduction is possible without discomfort. The abduction splint is then discarded and full voluntary movements are encouraged until full function is restored. We agree with Hitzrot [8] and Haussling [9] that if the acute cases are properly managed much of the prolonged treatment necessary could be greatly minimized.

In 1923 one of us [10] reported satisfactory results with diathermia in periarthritis of the shoulder, and similar experiences were reported by Mumford.[11] If, with the aid of diathermia and active and passive stretching exercises, there persists limitation of range of motion in the joint, manipulation of the shoulder under anesthesia should be seriously considered. We agree with Perkins [12] that the most satisfactory results from manipulative treatment are obtained in the group of cases due definitely to trauma (not included in this series). However, manipulation has a definite place in the treatment of selected cases of the group under consideration. When the acute symptoms have subsided and the general treatment is adequate, if limitation of range of movement persists on account of strong adhesions which have formed, a great deal of convalescing time can be saved for the patient by breaking these adhesions by manipulation. Under nitrous-oxide anesthesia the shoulder is manipulated deliberately and gently. We always keep in mind that we may be dealing with marked atrophy of the bone structures and very dense adherent bands and care is taken to prevent dislocation or fracture. For this reason leverage grips are used. The point is to break the adhesions completely and to avoid causing any more reaction about the joint than is absolutely necessary. The arm is forced through full abduction, internal and external rotation and fixed in abduction with traction.

RESULTS

Very gratifying and satisfying results have been obtained by the adoption of the foregoing principles. It has been demonstrated that the calcium deposits are quite unstable and readily disappear with diathermia treatment (Dickson,[10] Mumford [11]). The joint becomes painless and the normal range of movement is restored. Our figures show that 188 of the 200 patients, or 94 per cent, recovered completely with loss of pain and return of normal function. The majority of patients required from one to six months' treatment for complete recovery. A few had symptoms from one to two years, but ultimately obtained satisfactory results.

An analysis of table 3 shows that while in more than 50 per cent of the cases symptoms were present from six months to two years, over 85 per cent of the patients recovered normal, painless function within a period of six months after the institution of treatment. This can only indicate that the patients have had very ineffective treatment in the early stages of the disease. An interesting feature is that no matter whether the chief etiologic factor was considered to be trauma, infection or true metabolic irregularities, or whether the joints were manipulated under anesthesia or whether the calcified bodies were removed, the recovery period was approximately the same in all groups.

Many writers have given the impression that they considered those cases in which a calcified deposit was demonstrated roentgenologically quite different from those, similar in every other respect, except that the roentgenogram revealed no shadow. We feel that the basic pathologic state is the same in all these cases and that the principles underlying treatment should be identical. Calcification tends to disappear with the subsidence of symptoms, and it may be that it is just an indication of the stage of attempted repair. A review of some of the reports would lead one to believe that the finding of a calcified area roentgenologically should be an invitation for its surgical removal. We certainly cannot subscribe to this conception. In making this statement we realize that we have operated on only five

TABLE 3.—*Time Under Treatment* *

Time	Duration of Symptoms Before and With Treatment: Satisfactory	Unsatisfactory Nonremovable Cause	Injury	Infection	Injury and Infection	Specific Metabolic Changes Plus Infection: Diabetic	Hyperthyroid	Hypothyroid	Calcium Not Removed	Manipulated: Operated	With Calcium	Without Calcium
1 week	..	..	..	12	9	3	1	..	1	7	..	12	..
2 weeks	4	..	..	3	9	6	..	..	..	7	..	..	4
3 weeks	6	..	1	..	11	2	1	1	..	7	..	1	1
1 month	9	..	..	4	12	12	2	3	2	11	..	23	12
2 months	25	..	12	23	29	13	1	3	2	13	4	22	13
4 months	32	..	..	22	12	5	1	4	..	6	..	1	32
6 months	37	..	1	32	10	6	1	3	..	10	..	2	..
1 year	20	8	..	4	2	..	..	2	1	2	1	..	..
2 years	30	4	1	1	9	..	..	1	..	..	..	..	..
	173	12	5	17	95	70	7	18	7	68	5	14	8

* In twenty-seven cases, complete data on the duration of symptoms could not be obtained.

of the seventy-five patients who gave evidence of having calcium deposits in the shoulder. But, in comparing these five cases with those in which manipulation only was done, we do not feel that we made their convalescence materially less irksome or lessened the time of their disability. In all cases in which operation was done we also had to break down adhesions in order to obtain full abduction and rotation of the arm, and we are of the opinion that this was more important to the patient than the removal of the calcium deposit.

Codman,[1] Brickner,[2] Carnett [3] and Harbin [4] all have reported excellent and satisfactory results by excision of the bursa or removal of the calcified body. A review of their reports, however, will show that although the calcium was removed, manipulation and the breaking down of adhesions also was done and the arm was fixed in full abduction. We cannot help but feel, in the light of our own experience, that the excellent and satisfactory results reported by them can be attributed to the breaking down of adhesions and fixing the shoulder in the position of physiologic rest rather than to the removal of the calcium deposits. An analysis of Codman's [1] and Harbin's [4] cases shows that the time required for recovery was practically identical with that in the series we are reporting.

In the 200 cases in our series 12 patients failed to make a satisfactory recovery. In one, the patient

8. Hitzrot, James: The Painful Shoulder, Minnesota Med. **2**: 148 (March) 1928.

9. Haussling, F. R.: Painful Shoulder, S. Clin. North America **6**: 1503 (Dec.) 1926.

10. Dickson, J. A.: Diathermia in Periarthritis of Shoulder, S. Clin. North America **4**: 1053 (Aug.) 1924.

11. Mumford, E. B., and Martin, Florence J.: Calcified Deposits in Subdeltoid Bursitis, J. A. M. A. **97**: 690 (Sept. 5) 1931.

12. Perkins, George: Painful Shoulder, Proc. Roy. Soc. Med. (Sect. Orthop.) **22**: 548 (Feb.) 1929.

refused to have foci removed and in another there was a marked hypothyroidism which would not respond to general treatment. The remaining ten patients had what we felt was adequate general and local treatment, and although they showed considerable improvement, slight discomfort continued.

An extremely interesting fact has been brought out in the follow-up study of this series of cases. Of the 200 cases, 93 were seen prior to 1928, and although the affected shoulder has remained well in all these, with one exception (in which there was a slight temporary recurrence) 13 patients later developed joint symptoms elsewhere. Of these thirteen, ten gave a history of some gastro-intestinal disturbance at the time they were under treatment for the shoulder condition. Five had infected teeth and tonsils removed at that time, but in spite of the eradication of foci have subsequently developed other joint complications. This emphasizes the fact that there may be some general metabolic factor in these cases. Of the 107 patients seen since 1928, none has shown this tendency to date.

The study of the cases reported in the literature and of our series of 200 cases has shown us most strikingly that an exact evaluation of the importance of any one of the factors which may be involved in the causation of the disease, or of the relative value of the various therapeutic measures, is practically impossible. For, in our series, it has been found that in all cases, whether the evidence pointed to infection, metabolic disturbances or trauma as the important etiologic factor; whether the treatment stressed was eradication of foci, physical measures, manipulation or operation, that the time required for recovery and the total duration of the disease was remarkably constant throughout. This suggests that in these cases there must be some general physiologic disturbance as a common denominator, which cannot be explained or accounted for at present. We reiterate this statement because this fact seems to have been lost sight of by many workers in their enthusiasm for one particular type of treatment, or in their zealous endeavor to attribute the symptoms to some particular etiologic factor.

SUMMARY

The following conclusions are suggested from the study of our 200 cases.

1. The clinical syndrome, periarthritis of the shoulder, is not influenced by the presence or absence of calcium deposits, and the presence of calcium is not an indication for operation.

2. Foci of infection and glandular dysfunction would seem to be much more important as etiologic factors than trauma.

3. There is some common underlying alteration in the physical state which is influenced by focal infection and endocrine irregularities that determines the deposition of calcium.

4. Patients with periarthritis of the shoulder, if adequately treated in the early stages of the disease, tend to recover in from one to six months.

5. General treatment in these cases is important.

ABSTRACT OF DISCUSSION

DR. MYRON O. HENRY, Minneapolis: Dr. Dickson has presented a large series of cases, which have been followed up for more than a year after the treatment. For some time I have been treating these patients in essentially the same manner in my orthopedic practice in Minneapolis. I also use the abduction splint and physical therapeutic measures. I find that it is seldom necessary to operate on these shoulders and that manipulation is being employed in fewer cases. I wish to emphasize the treatment of the local condition by proper diathermy because the results of this form of physical therapy have been uniformly good in my hands. I have seen calcium deposits disappear under diathermy, but usually the pain subsides long before the calcium deposits disappear. I agree that periarthritis is usually associated with some general metabolic problem, and I also feel that it is frequently associated with infection elsewhere. The effect of trauma in the presence of infection is becoming of tremendous importance in compensation cases in America, and on this account particularly it is important to investigate and clean up all possible foci of infection. I heartily endorse Dr. Dickson's stand for treatment from the general standpoint as well as that of the local measures for relieving the shoulder.

DR. W. B. CARRELL, Dallas, Texas: The clinical behavior of periarthritis suggests a low grade infective process but I have not been able, in a much smaller series, to find a contributing focus in the percentages quoted by Dr. Dickson. The explanation is most probably to be found in my utilizing less freely the aid of collateral investigations so easily available to the author. I am further convinced of this by the observation that recovery is notably more rapid in those cases in which positive focal infections are removed. I have followed the general plan for local treatment of the joint almost as described. As to the right time for manipulations, I should like to express appreciation for the teaching during the war and since of Sir Robert Jones, and would recommend to those who have not read it his William Mitchell Banks lecture on the "Problem of the Stiff Joint." The best way to treat adhesions, he says, is to prevent them. In these shoulder disabilities with persistent soreness, tenderness and gradually increasing stiffness, the arm should be at complete rest, in the abducted and outwardly rotated position; then with gentle active and passive motions, baking and light massage motion is reestablished as the infection subsides and before dense adhesions occur. The operative removal of calcareous deposits, in my experience, has likewise been of doubtful value.

DR. JOSEPH E. WHEELER, Jefferson Barracks, Mo.: I am sure that all are in accord with Dr. Dickson's terminology because not just an arthritis of the shoulder is present but structures above the shoulder also are involved. Many authors have stated that this condition is due to some metabolic influence, and possibly this is true; but in Dr. Dickson's series as well as in others the basal metabolic rate is usually normal. In his paper I believe he states it was abnormal in but 20 per cent of the cases. I think that Dr. Dickson has not stressed trauma quite as much as he should. If the history is searched deeply enough, one usually finds that this condition came on after some strain, such as reaching for something or extending the hand above the shoulder. Focal infection seems to play a great part in different cases I have seen. In many instances, after removal of the foci of infection the symptoms have subsided. These patients should be considered as really sick while in the acute stage. They should be put to bed and the shoulder should be placed in proper abduction with external rotation. One should not send them away with just some palliative treatment because, if one does, it will become chronic. I think that diathermy should not be given in the acute stage, but after the condition has become chronic diathermy should be instituted. Ionization can be used, too, because if there is some cicatricial formation around the supraspinatus tendon it has a tendency to dissolve that cicatrix. Manipulation should be begun as soon as possible. If necessary one should give the patient a general anesthetic and after that the manipulation should be continued. The patient should be instructed in the simple method of the finger ladder by which he gradually works his shoulder up into abduction. By making a mark on the wall he can in that way tell the progress he makes.

DR. WILLIS C. CAMPBELL, Memphis, Tenn.: I think that quite a percentage of these cases are instances of gout and that the chemical examination of the blood will show increased uric acid. Dietetic measures and other routine treatment for gout frequently will give rapid relief.

DR. JAMES A. DICKSON, Cleveland: I feel, as Dr. Campbell does, that the solution of a number of these problems is going

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to come from increased knowledge of the chemical changes of the blood. The condition should be viewed from a general standpoint rather than with the attitude that any particular focus of infection or any one particular metabolic factor is responsible for this clinical syndrome.

THE TREATMENT OF CERTAIN CARDIAC ARRHYTHMIAS WITH POTASSIUM SALTS

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SAN FRANCISCO
AND
EVELYN M. ANDERSON, M.D.
MONTREAL

Many inorganic salts, especially of the alkaline earth elements, have been used experimentally in control of the heart rhythm of lower animals, but as far as is known potassium salts have never been applied for this purpose to man, prior to the time of our preliminary report [1] in November, 1930.

The rationale of potassium therapy of human cardiac arrhythmias is based on experimental evidence, from various sources, that potassium ion excess in the fluid perfusing a heart will prevent extrasystole formation from mechanical, electrical or pharmacologic stimuli. Ringer [2] and later investigators have studied the influences of other ions, and especially the conflicting actions of calcium and potassium. A definite ratio of calcium and potassium ions, or certain substitutes, is a recognized necessity for the maintenance of normal cardiac activity.

Excessive calcium was found to increase the strength of contraction and to lengthen the duration of systole. It also decreased the sino-auricular nodal rate (Gross [3]), and increased the rate of auriculoventricular conduction (von Egmond [4]) and the tendency toward spontaneous ectopic beats, both auricular and ventricular, whether they are isolated or sequential. Predominance of calcium ions has also caused auricular and ventricular fibrillation (Rothberger and Winterberg,[5] Hoffman [6]).

Potassium diminished the strength of contraction, shortened systole, speeded the sino-auricular nodal rate (Gross,[3] Hoffman [6]) and increased the auriculoventricular conduction time. Hering [7] stopped paroxysmal ventricular tachycardia and ventricular fibrillation by intravenous injection of potassium chloride in the dog. Many investigators, including Rothberger and Winterberg,[5] Anrep,[8] Wiggers [9] and D'Haluin,[10] have similarly stopped both auricular and ventricular ectopic rhythms by intravenous or intracardiac injections of solutions of this salt. Wiggers [11] suggested the possibility of therapeutic use of potassium chloride in ventricular fibrillation caused by accidental electrocution, and likewise demonstrated its absorption from the pericardial sac. Hooker [12] injected potassium chloride into the carotid artery and stopped ventricular fibrillation without the cardiac massage found necessary by others.

Norn [13] and others have shown recently that potassium, as the chloride, could be administered without danger to a normal man and produce an appreciable rise of potassium content of the blood serum. Thus, 12 Gm. of potassium chloride orally administered, in a typical experiment, caused the following changes in the potassium content of the blood serum: 17.8 mg. per hundred cubic centimeters fasting; 21 mg. forty-three minutes after administration; 28.4 mg. in two hours and nine minutes, and 20.4 mg. in six hours. Wilkins and Kramer [14] have demonstrated a maximum rise in the potassium content of the blood serum to 35.3 mg. per hundred cubic centimeters two hours after the ingestion of 15 Gm. of potassium chloride. A return to normal level occurred three and a half hours after the ingestion of the salt. In patients with good renal function, the rate of urinary excretion followed approximately in direct proportion to the potassium content in the blood serum. Increased sodium chloride intake seemed to slow the rate of absorption, whereas water and diuretics seemed to speed its excretion.

Fig. 1.—Electrocardiographic record in case 9. *A* shows leads I, II and III made during fasting; *B*, lead II made thirty-five minutes after the administration of 2 Gm. of potassium chloride; *C*, lead II, two and one-half hours after the administration of 2 Gm. of potassium chloride.

Smillie [15] observed that potassium chloride in a dose that had no effect on normal persons, e. g., 10 Gm., caused acute poisoning in one patient who had chronic nephritis with faulty excretion of the potassium chloride. Wilkins and Kramer [14] found a slightly increased amount of potassium in the blood serum of patients with definite nitrogenous retention and diminished phenolsulphonphthalein excretion. Rabinowitch [16] further showed that in nephritis, despite reduction of total blood plasma bases, the potassium content was never lowered and frequently was markedly increased. Cushny [17] stated that a blood serum concentration of 0.5 per cent of potassium is seriously toxic to the heart,

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1. Sampson, J. J., and Anderson, Evelyn M.: Proc. Soc. Exper. Biol. & Med. **28**: 163 (Nov.) 1930.
2. Ringer, S.: J. Physiol. **3**: 380, 1882; **4**: 429, 1883.
3. Gross, E.: Arch. f. d. ges. Physiol. **99**: 264, 1903.
4. von Egmond, A. A. A.: Arch. f. d. ges. Physiol. **134**: 39, 1913.
5. Rothberger, C. J., and Winterberg, H.: Arch. f. d. ges. Physiol. **142**: 461, 1911.
6. Hoffman, F. B.: Ztschr. f. Biol. **66**: 291, 1915.
7. Hering, H. E.: Zentralbl. d. Physiol. **17**: 1, 1903.
8. Anrep, A.: Personal communication.
9. Wiggers, C. J.: Am. J. Physiol. **99**: 223 (Feb.) 1930; **93**: 197 (May) 1930.
10. D'Haluin, M.: Ann. Soc. Sc. Brux. **46**: 602, 1926.
11. Wiggers, C. J.: Am. Heart J. **5**: 346 (Feb.) 1930.
12. Hooker, D. R.: Am. J. Physiol. **91**: 305 (Dec.) 1929.
13. Norn, M.: Skandinav. Arch. f. Physiol. **55**: 211 (Jan.) 1929.
14. Wilkins, Lawson, and Kramer, Benjamin: Studies on the Potassium Content of Human Serum, Arch. Int. Med. **31**: 916 (June) 1923.
15. Smillie, W. G.: Potassium Poisoning in Nephritis, Arch. Int. Med. **16**: 330 (Aug.) 1915.
16. Rabinowitch, I. M.: J. Biol. Chem. **62**: 667 (Jan.) 1925.
17. Cushny, A. R.: The Secretion of the Urine, London, 1917, p. 157.

which warrants caution in giving large doses of potassium salts to patients with known kidney damage.

EXPERIMENTAL WORK

Potassium salts were administered orally to fifty-eight patients who were known to have auricular or ventricular ectopic beats or paroxysmal auricular or ventricular tachycardia for an appreciable period of time. One of the patients received, in addition, 10 cc.

TABLE 1.—*Effect of Potassium on Arrhythmias; Summary of Fifty-Eight Cases*

	Number of Cases	Average Age, Years
Positive effect	29	61
Paradoxical effect	3	76
Doubtful effect	10	55
No effect	16	40
Total	58	

of potassium chloride intravenously in a 1 per cent solution without ill effect, but with no demonstrable advantage over the oral route of administration.

Six different salts of potassium were used, namely, the chloride, iodide, bromide, citrate and acetate, all with apparently identical effects when applied to the same patient (case 3). As a control measure, sodium acetate was given and produced no change in the arrhythmia. Kisch [18] placed the order of activity of certain anions in compounds of potassium as follows:

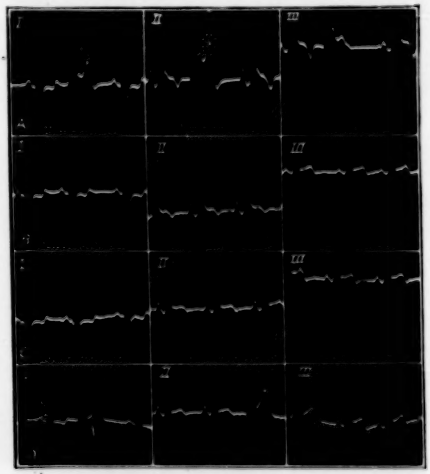

Fig. 2.—Electrocardiographic record in case 3. *A* shows leads I, II and III after fasting; *B*, forty minutes after the administration of 2 Gm. of potassium chloride; *C*, two hours and twenty minutes after 2 Gm. of potassium chloride; *D*, five and one-half hours after 2 Gm. of potassium chloride.

$Cl < Br = SCN < NO_3 < I$, but these anion influences were undoubtedly of lesser magnitude than other variables noted in our investigation.[19]

The acetate caused less gastric distress than any of the other salts, so this compound was adopted for routine use, in a 25 per cent aqueous solution.

In the fifty-eight cases (table 1) of auricular and ventricular ectopic beats and tachycardias, complete

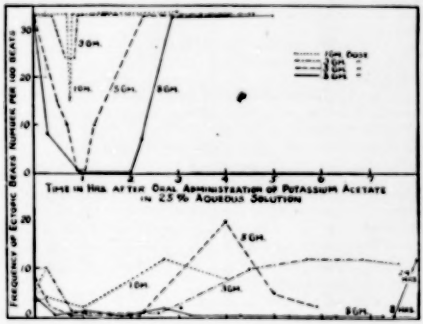

Fig. 3.—The effect of increasing the dosage of potassium acetate in case 52 (upper chart) and case 40 (lower chart). Doses administered at forty-eight hour intervals.

eradication of the arrhythmia was obtained in twenty-nine cases. Two cases in this group demonstrated ventricular ectopic beats accompanying an overdosage of digitalis. Figure 1 shows the records of a woman, aged 70, with rheumatic heart disease and generalized arteriosclerosis, who was known to have received an excessive amount of digitalis.

As can be seen from table 1, twenty-nine patients did not show a definite favorable response. Six of this group had an apparent diminution of the number of ectopic beats without complete disappearance and three showed probable paradoxical effects. Such paradoxical effects could be predicted from the experimental observations of Scherf,[20] Ekerfors,[21] and, earlier, Hering [7] and Niccolini,[22] who demonstrated a remarkable reversal of the customary action of potassium and calcium under certain circumstances. Calcium eliminated the aberrant beats, while potassium precipitated them in paroxysms.

Of the three patients who probably showed paradoxical effects, one initiated paroxysmal ventricular tachycardia during the administration of potassium, and likewise had severe somatic muscular cramps, which disappeared on its withdrawal. In this case the potassium content of the blood serum was 25 mg. per hundred cubic centimeters and the calcium content 13 mg. per hundred cubic centimeters twenty-four hours after administration of 5 Gm. of potassium acetate. The other two patients of this group showed apparent increases in the numbers of ventricular ectopic beats.

In the sixteen cases with no demonstrable effect, ten of the patients were free of any other evidence of cardiac disease. Table 1 shows that in the twenty-nine positive cases, the average age was 61 years. All but three of these patients had definite evidence of arteriosclerosis. One patient showed premature arteriosclerosis at the age of 30 years. Delayed excretion of potassium salts due to arteriosclerotic involvement of

18. Kisch, B.: Arch. f. Exper. Path. u. Pharmakol. **116**: 189, 1926.
19. The good effects of potassium iodide observed by many in its clinical use in arteriosclerotic heart disease in the past may have been due to the potassium rather than the iodide ion.
20. Scherf, D.: Ztschr. f. d. ges. exper. Med. **65**: 255, 1929.
21. Ekerfors, H.: Compt. rend. Soc. de biol. **103**: 441 (Feb. 14) 1930.
22. Niccolini, P.: Arch. di fisiol. **23**: 357, 1924.

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the kidney, as yet unproved, may be an important factor in determining response.

DOSAGE

From 1 to 4 Gm. were used, at first, as trial doses, and so inconstant were the responses as to suggest lack of correlation between size of dose and therapeutic effect. So great were the variations from unknown sources that the patient's weight was never taken into account in calculating the dose.

Thus, in case 3 (fig. 2), a woman, aged 62, weighing about 160 pounds (72.6 Kg.), with arteriosclerotic heart disease and coronary artery occlusion, was free of both ventricular and auricular ectopic beats for five hours after administration of 2 Gm. of potassium acetate. In contrast, in case 27, a woman, aged 66, weighing 119 pounds (54 Kg.), with hypertension and arteriosclerosis, received 10 Gm. of potassium salt without the slightest demonstrable influence on frequently recurring ventricular ectopic beats.

With study of the more recent cases in our series, evidence has been accumulated to show that variation of dosage influences the latent period, the duration and the degree of therapeutic effect.

Figure 3 illustrates the influence of increasing doses on the arrhythmias in two cases. Case 52 presented an excellent opportunity for this trial of dosage, demonstrating a constant trigeminus, one ventricular ectopic beat to two normal ones, at every observation for approximately two months. The patient, a woman, aged 42, had no other demonstrable heart lesion. It will be observed that doses of 1 and 3 Gm. were practically ineffective, and that 5 and 8 Gm. caused relatively short periods of freedom from the ectopic beats. It is pertinent that diuresis shortly preceded the return of the arrhythmia, and probably represented a sudden increased potassium excretion.

The curves of the arrhythmia changes in case 40, that of a 76 year old man with syphilis and arterio-

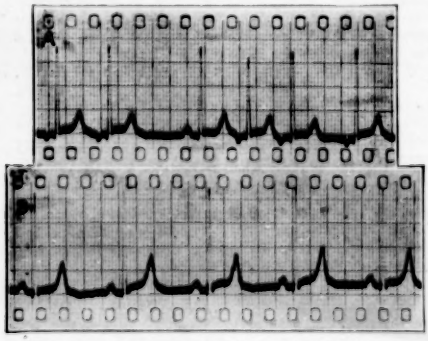

Fig. 4.—Electrocardiographic record in case 50. *A* shows lead I made during fasting, and *B*, lead I made forty minutes after the administration of 3 Gm. of potassium acetate.

sclerosis, are not as satisfactory, since this patient's auricular and ventricular ectopic beats, although always present, varied widely in frequency, especially increasing on exertion. However, no ectopic beats were observed eight and a half hours after the administration of 8 Gm. of potassium acetate. The curve of his response to 3 Gm. resembles the 8 Gm. curve of case 52.

It is apparent that the threshold of potassium influence on heart arrhythmias varies widely, and no law can be discovered at present that governs this other than possible variation with age. It will be seen from table 1 that the average age of patients showing favorable response to the administration of potassium was

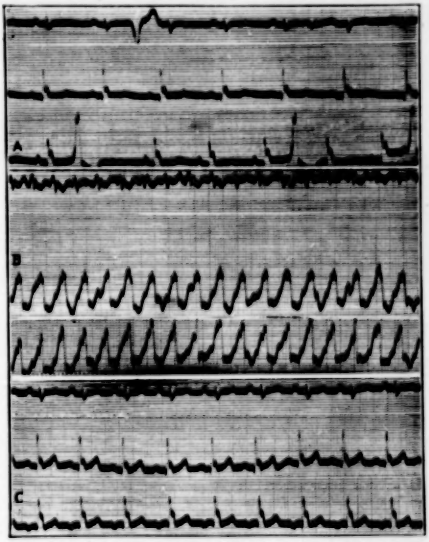

Fig. 5.—Electrocardiographic record in case 1. Leads I, II and III: *A* was made one month prior to the onset of paroxysmal ventricular tachycardia; *B*, during the attack, and *C*, forty minutes after the administration of 4 Gm. of potassium chloride.

61 years, and of those showing no response was 40 years.

This individual variation in threshold was found by repeated study of certain cases originally failing to show response. As an example, case 49, that of a woman, aged 40, with showers of ventricular ectopic beats, but without organic heart disease, illustrated that initial doses effective in other cases, i. e., 8 and 12 Gm., were below her threshold, and only when 16 Gm. had been administered did the arrhythmia disappear.

The use of subeffective doses may account for many of the failures reported in our series, but, on the contrary, certain persons may be entirely refractory to the action of this element.

LATENT PERIOD AND DURATION OF EFFECT

From what has been shown in case 52, the latent period will be seen to vary somewhat with the dose, but in the majority of cases response occurred in about forty minutes, with a minimum of twenty and a maximum of ninety minutes' variation.

The duration of effect has been likewise illustrated to vary widely with dosage. From three to eight hours is the range for most cases. In case 50 (fig. 4), that of a man, aged 60, with evidence of coronary arteriosclerosis, who had been observed with constant runs of auricular ectopic beats for six months, the condition cleared forty minutes after the first dose of 3 Gm. of

potassium acetate, and ectopic beats have never been observed since.

The duration of effect should be determined where the arrhythmia tends to recur, and the dose periodically repeated if constant freedom from the ectopic rhythm is desired. From 2 to 4 Gm. every six to eight hours has proved an effective ration in many cases.

TABLE 2.—*Effect of 2 Gm. of Potassium Chloride, Administered Orally, on the Potassium Content of Blood Serum* *

Case	Fasting	½ Hour After 2 Gm. Potassium Chloride	1½ Hours After 2 Gm. Potassium Chloride
1	18.55	20.836	17.78
2	16.604	19.57	18.658
14	22.17	.....	21.3
15a	22.0	24.4	25.8
36	17.6	.....	20.1

* All except case 15 showed positive influence of potassium on arrhythmia. The amounts are given in milligrams per hundred cubic centimeters The technic was that of Kramer and Tisdall: J. Biol. Chem. **46**: 339 (April) 1921.

After two months administration in case 1 (discussed later), the arrhythmia returned while the patient was still under treatment; but this patient, by increasing his dosage, could obliterate any disturbing showers of the ectopic beats. Apparently after two years and two months observation of this patient, the use of potassium acetate as a constant ration or in isolated doses was still effective, and produced no demonstrable damage to his kidneys or other organs.

INFLUENCES ON VARIOUS ARRHYTHMIAS

Auricular and ventricular ectopic rhythms were equally influenced by the medication. Case 1 was the only example in which paroxysmal ventricular tachycardia was interrupted and its recurrence prevented. Case 40, previously mentioned and case 51, that of a woman aged 53, with hypertension and moderate generalized arteriosclerosis, were the only two examples of a similar action on paroxysmal auricular tachycardia. Auricular fibrillation was unaffected, and in case 3 auricular fibrillation started while the patient was on the potassium ration.

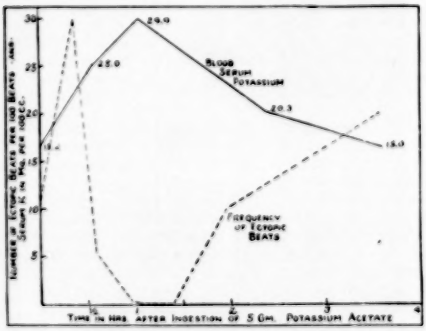

Fig. 6.—Potassium content in the blood serum and the ectopic beat changes following the ingestion of 5 Gm. of potassium acetate in case 52.

Figure 5 shows the records of case 1, that of a man, aged 30, with premature arteriosclerosis observed in four attacks of paroxysmal ventricular tachycardia, varying from sixteen hours to five days in duration. Each attack was terminated within the expected time of one hour after administration of from 2 to 10 Gm. of potassium chloride or potassium acetate. Such behavior could be coincidental, but strongly suggests a therapeutic effect.

ELECTROCARDIOGRAM ALTERATION

The experimental influence of potassium on the electrocardiogram of the dog has been demonstrated by Wiggers [11] and others. In our series of cases, occasionally certain definite changes were observed on the electrocardiogram after oral administration of potassium. In case 3 (fig. 2) there was a reversal of direction of T_2 and T_3 after the patient took 2 Gm. of potassium chloride. This directional reverse persisted after the recurrence of the ectopic beats five hours later, but was lost when the patient was observed in twenty-four hours.

UNDESIRABLE EFFECTS

Other than the ill effects mentioned previously, as probable paradoxical actions, there have been no serious clinical disturbances caused by the doses of potassium salts given.

Gastric distress, abdominal cramps and diarrhea rarely occurred, and contrary to anticipation, definite diuresis was uncommon. In case 7 some intestinal bleeding occurred after a diarrhea, but an increased bleeding or clotting time was not found.

THEORY OF MODE OF ACTION

The strange variation in behavior of different cases may be due to any of five factors:

1. Variation in cause of the ectopic rhythms.

2. Variation of absorption and excretion of potassium. This hardly seemed probable from the figures we obtained in table 2. The highest rise in the potassium content of the serum occurred in the patient showing no response to the drug, and it was lowered in two patients showing favorable response to the trial dose. The changes in the potassium content of the serum paralleling the influence on the arrhythmia in case 52 are illustrated in figure 6.

3. Increased concentration of potassium selectively, in other tissues than the heart in certain persons. Kramer and Tisdall [23] found the concentration of potassium in human corpuscles about 430 mg. per hundred cubic centimeters of corpuscles, which is about twenty times the concentration of potassium in serum. Gerard [24] obtained results which indicated that the potassium content of cells could be influenced appreciably by the ingestion of potassium salts. Thus the release of potassium from the cells may account for the observed therapeutic effect sustained for several hours after the ingestion of the potassium.

4. A rise in the potassium content of the serum influencing the arrhythmia more readily when the potassium content of the heart muscle is lower than normal. Harrison and his collaborators [25] have found that the potassium content of heart muscle is low in myocardial failure and degenerative heart disease, especially with edema; and thus a certain absolute increase of potassium would be a relative increase of greater magnitude in a failing heart than in a normal heart. This hypothesis accounts for the posi-

23. Kramer, B., and Tisdall, F. F.: J. Biol. Chem. **53**: 241 (Aug.) 1922.

24. Gerard, P.: Compt. rend. acad. d. sc. **154**: 1305, 1912.

25. Harrison, T. R.; Pilcher, C., and Ewing, G.: J. Clin. Investigation **8**: 325 (April) 1930. This work has not been confirmed by Scott (J. Clin. Investigation **10**: 745, 1931).

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tive effect of potassium in certain cases of organic heart disease, especially in arteriosclerotic involvement of the coronary arteries, and absence of effect in most of the "functional" cases.

5. Relation of calcium to potassium concentration both in the blood serum and in the tissues. We are now working on the calcium-potassium balance in those cases with high and low thresholds.

CONCLUSION

Administration of potassium salt orally was an effective measure in checking 50 per cent of auricular or ventricular ectopic beats and tachycardias, in doses of from 1 to 16 Gm. Increased age and the presence of organic heart disease seemed to lower the threshold of demonstrable effect of potassium salts on these arrhythmias.

Dr. J. M. Read and Dr. E. S. Kilgore supplied case histories, Dr. William J. Kerr his clinical material; Dr. H. Becks and Dr. F. Eberson made the determinations for the potassium content of the serum, and Miss O. Nagle and M. Duban gave technical assistance.

ABSTRACT OF DISCUSSION

DR. T. R. HARRISON, Nashville, Tenn.: Following Ringer's classic experiments, in which he showed that the action of the heart could be influenced by potassium and by calcium, physiologists and pharmacologists attempted to alter the various types of abnormal heart action by these substances. However, it was found that potassium, when given intravenously, was extremely toxic and that the dose that would cause a favorable effect was close to the dose that might be fatal. Therefore, the administration of potassium seemed to be a dangerous procedure and fell into disuse as a clinical measure. The report by Sampson and Anderson constitutes the first systematic attempt at a clinical study of the subject and it is based on the fact that the authors departed from the intravenous method and began to give the drug by mouth. Their results are of great interest. The charts would seem to demonstrate that the changes observed in the arrhythmias were actually due to the administration of the potassium salts. In looking over my records I have found that in certain instances patients receiving the salt had fewer extrasystoles, and so on. I can confirm the authors' statements concerning the harmlessness of potassium salts administered by mouth. In a number of patients I have given potassium dibasic phosphate in doses of 6 Gm. daily for a period of from a few weeks to a year and have yet to observe any untoward effects. Therefore I think that the method can be regarded as being entirely safe.

DR. L. F. BISHOP, New York: I should like to ask whether ammonium acetate was tried in any of these cases.

DR. J. MARION READ, San Francisco: One point that was brought out should be emphasized: Potassium has a greater and more lasting effect on patients with organic heart disease. This was illustrated by two patients of mine, included in the authors' series. One was the young woman who received 16 Gm. of potassium acetate. She did not present any evidence of organic heart disease but had a prolonged period of irregularity. Cessation of the irregularity was produced by the administration of 16 Gm., but the irregularity had returned the next morning. In a case, on the other hand, in which a man, aged 72, had a coronary occlusion with ectopic beats that bothered him greatly, the ventricular ectopic beats ceased entirely after a dose of only one third that given the young woman.

DR. WILLIAM J. KERR, San Francisco: It is probable that the value of potassium iodide in older people is due to the control of extrasystoles, by reducing irritability of the cardiac muscle. For the present the place of potassium salts in the treatment of cardiac disease seems to be in the control of extrasystoles. Ventricular tachycardia may also be prevented or terminated by its use.

DR. JOHN J. SAMPSON, San Francisco: Relative to Dr. Kerr's comments on potassium iodide, that salt was used on one patient for months without thought as to its possible action on an arrhythmia. It was withdrawn and resumed later and found to have a definite effect in relieving the auricular ectopic beats otherwise constantly present in this patient. There is one other point worthy of comment that was not mentioned in the paper for lack of time: A sense of well being was experienced by some of the patients when on potassium rations, which disappeared on withdrawal of this medication.

SMOOTH MUSCLE CONTRACTIONS OF THE SMALL BOWEL

DEMONSTRATION OF AN ACTIVE PRINCIPLE CAPABLE OF STIMULATING THESE CONTRACTIONS

MARTIN E. REHFUSS, M.D.
PHILADELPHIA

For the last four years my associates and I have been studying the behavior of the excised smooth muscle of the digestive tract of various laboratory animals. The animals selected for this work were the rabbit, cat, dog and steer. In common with most workers in this field, we have been able to demonstrate by means of refined technic now applied to excised smooth muscle strips an independent beat and tonicity that is more or less characteristic for each particular part of the digestive tract. These responses, while more or less characteristic for each segment of the tract, vary somewhat with the species, but are usually highly characteristic for the species. Inasmuch as the excised muscle preparation is independent of extrinsic nerves and circulatory control, the result obtained can be assumed to be due to the behavior of the muscle tissue and only the retained ganglions. In our earlier studies we were able to demonstrate that the beat of excised muscle is sensitive to alterations in the hydrogen ion concentration of Locke's solution. This finding was encountered with muscle strips from various laboratory animals and has been reported by us in a study of the gastric musculature. A second factor was the oxygen and carbon dioxide content, which likewise was capable of altering the rhythmic response. Apart from these factors, ordinary saline extracts of the gastric and duodenal mucosa were found ineffective when tried on excised muscle preparations under good experimental conditions.

The following studies were made by Merman, Dreier, Harris and Zahn under my direction and represent a different approach to the problem. While saline mucosal extracts were ineffective for the reason, which we found later in our study, that the addition of saline solution destroys the active principle, we were led, owing to the extreme sensitiveness of muscle preparations to the hydrogen ion concentration, to use mucosal extracts with Locke's solution. Extracts were systematically made of every known tissue in the rabbit and were tested on the excised duodenal muscle of the same animal. In the first series, thirty-eight different extracts were prepared and tested under uniform experimental conditions. This study revealed the fact that there is present in certain tissue extracts, notably those of the upper digestive tract, and to a certain extent in parenchymatous organs, a substance that alters the beat and increases the tonus. It is essential that this change occur in the absence of any noteworthy change in the p_H of the surrounding solution or in the oxygen-carbon

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dioxide ratio. Tests in each instance were carefully applied by the calomel-hydroquinone electrode to rule out this possibility. The substance was discovered not only in the rabbit but also in other laboratory animals studied, namely, in the cat, the dog and the steer. The rather widespread distribution of the substance and the fact that its effect is highly characteristic attracted us to the investigation of the nature of this response. We began by studying extracts of the duodenum, and elsewhere we are reporting the effect of extracts from various parts of the tract. The most powerful result was obtained from duodenal extract. The stomach, jejunum and other organs undoubtedly contain a similar substance.

In experiments, the results of which are about to be published, we were able to show that the extract is active not only on the excised muscle strip but also, by intravenous injection, either through the marginal vein of a rabbit's ears, or the brachial plexus of the dog and by mesenteric injection. In other words, these tissue extracts contain a substance that is capable of acting not only on the excised muscle in vitro but also through the circulation in vivo. More than 1,000 feet of 16 mm. motion picture film illustrates the rapidity with which the response is obtained. In a large number of exploratory experiments, numbering many hundreds, these observations were verified to our satisfaction. We then proceeded to study substances that might have a similar effect and to attempt an isolation of this principle in active form. Briefly, we have tried to answer the following questions:

1. Is the substance histamine? In our experiments histamine was ineffective, giving no response on the contracting isolated muscle.

2. Is it secretin? Ten grains (0.65 Gr.) of the best commercial preparation gave no response on the excised muscle in vivo. If a response can be obtained, it is chiefly on the duodenum, while our principle affects the whole bowel.

3. Is it cholecystokinin? A preparation of cholecystokinin made by us from the steer's duodenum, according to Ivy's technic, caused no contractions of the excised duodenum of a rabbit; however, a preparation of cholecystokinin 1802, kindly supplied by Dr. Ivy, caused some increase in tonus, but Ivy and his associates, Lueth and Kloster, report:[1]

> We had expected to find cholecystokinin would cause an increase in intestinal motility, because we frequently observe contractions of the intestine in barbitalized dogs following injections of cholecystokinin, in the course of our experiments on assaying various dilatin free preparations. We can state from the results of these observations that cholecystokinin has no effect on the motility of the stomach, whereas its effect on the intestine is so variable that it cannot be predicted.

The following is a preliminary report on the separation of our fraction in its most active form, a procedure that is virtually similar to the preparation of cholecystokinin by Ivy, but the fraction is apparently lost before the final separation of cholecystokinin, and so far has not been separated by us in pure form. Duodenum from a freshly killed steer is turned out, tied at both ends and then extracted with 0.4 per cent hydrochloric acid three times at one-half hour intervals and in quantity just sufficient to cover the intestines. This acid extract, after neutralization, is more active than either the original Locke's extract or that obtained by plain water. The acid fluid extract is combined with sufficient pure sodium chloride to make the resulting mixture contain from 25 to 30 per cent sodium chloride. This results in the formation of a preparation almost completely soluble in water up to three quarters of the original volume of fluid form from which it was precipitated. The precipitate can be removed by allowing the solution to stand for several hours, or by centrifugation. The filtrate has no action on the excised muscle and therefore is devoid of the active principle (at least not in active form). The precipitate of sodium chloride in solution is active on the strips. This precipitate is then dissolved in sufficient water and carefully treated with tenth-normal sodium hydroxide to p_H 5.5, when flocculation occurs. The precipitate is allowed to settle, and the liquid is decanted off or centrifugated. At this point the precipitate consists mainly of protein inactive on the excised muscle, but the filtrate is active. From there on we are unable to retain activity; in an attempt to remove cholecystokinin and then to differentiate the extract from it, we lose the activity, or interfering substances, as indicated by controls, cause a response similar to or detrimental to it. Attempts to recover an active substance from the trichloracetic acid filtrate have been unsuccessful, largely because trichloracetic acid has a depressor action on muscle strips and cannot be totally removed by extraction. It may likewise inactivate the substance. Ivy maintains that this sodium chloride precipitate (cholecystokinin) remains active for a year. We have found that in regard to the active substance, the salt precipitate becomes inactive after three weeks of refrigeration. Attempts at the isolation of the active substance by the usual metallic precipitants have not been successful in our hands.

PREPARATION OF THE EXTRACT
(Ivy's Preparation of Cholecystokinin)

1. The mucosa of the first 6 feet of pig's intestine is extracted with 0.4 per cent hydrochloric acid.

2. The hydrochloric acid extract (active in vivo and in vitro) is treated with solid sodium chloride to a concentration of from 25 to 30 per cent sodium chloride.

3. The filtrate, which is inactive, is discarded.

4. The precipitate is retained.

5. The sodium chloride precipitate is dissolved in water, and sodium hydroxide solution is added to about p_H 5.5.

6. The precipitate (mainly proteins) is discarded. The filtrate (active in vivo and in vitro) is retained and is treated with 20 per cent trichloracetic acid to make a final concentration of solution that will contain 5 per cent of the acid.

7. The precipitate is retained and washed with absolute acetone and ether. The result is cholecystokinin, according to our preparation, inactive in vitro.

8. The filtrate has been unsuccessfully worked up, thus far.

Filtrate 6 is precipitable by alcohol (and acetone), with no loss of activity. Separation from cholecystokinin, however, has been unsuccessful.

CHEMICAL METHODS OF ATTEMPT AT ISOLATION

1. The metallic precipitants were: (1) ($HgCl_2$) mercuric chloride; (2) ($CuSO_4$) copper sulphate; (3) ($ZnSO_4$) zinc sulphate; (4) ($FeSO_4$) ferrous sulphate, and (5) lead acetate. The metals were removed by hydrogen sulphide, and the solutions are aerated in vacuo to expel the hydrogen sulphide. All attempts were unsuccessful as far as activity with excised intestinal muscle strips is concerned.

2. Precipitation by acetone of the deproteinized (neutral) extract of mucosa (secured by acid treatment) was not always complete.

3. Absolute alcohol precipitation removes the substance active in vivo, but it is not always effective in vitro. Direct alcohol extracts may be directly tried on the animal when the concentration of alcohol does not exceed 40 per cent. Above this concentration alcohol causes a relaxation of the bowel. When

1. Lueth, H. C.; Ivy, A. C., and Kloster, G.: Further Observations on the Action of Cholecystokinin, Am. J. Physiol. **91**: 329 (Dec.) 1929.

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95 per cent alcohol is employed for direct extraction of the mucosa and the alcohol is removed by in vacuo distillation, the resulting fluid is active in vitro.

CONCLUSION

1. Evidence is presented to demonstrate the presence of an active principle in the mucosa of a large part of the digestive tract capable of stimulating the smooth muscle contractions of the small bowel.

2. By means of tissue extracts prepared with Locke's solution, this effect can be demonstrated in vitro on excised small muscle strips and in vivo by intravenous injections.

3. Evidence is presented to show that this substance is not histamine, secretin or cholecystokinin, although it is closely associated with the latter.

4. The preliminary report of an attempt to isolate such a principle is given.

ABSTRACT OF DISCUSSION

DR. A. C. IVY, Chicago: It is established that the hunger motility of the stomach is controlled in part by some type of hormone or humoral agency. Work on transplanted gastric pouches shows this to be a fact. A recent investigation demonstrates that fat inhibition of gastric motility is on a hormone basis, it being due to a chalone (inhibitory antacid) and not to the absorption of digested fat products or to a reflex nervous mechanism solely. Considerable attention was paid to the motility of intestinal transplants, which were made during the study of the hormone mechanism for pancreatic secretion before and after feeding. The motility of the intestinal transplant is quite irregular and it was possible to observe a definite increase after feeding. A preparation of cholecystokinin has been assayed recently on gallbladder and intestinal strips in the guinea-pig by Dr. Jung, and he finds, as Dr. Rehfuss has found, that it is highly important to control the p_H of the "bath." Dr. Jung finds that cholecystokinin causes both the intestinal strip and the gallbladder strip to contract, much as Dr. Rehfuss found in the experiments in which he used this preparation. I am at a loss to explain the failure of Dr. Rehfuss to obtain a response to histamine, because most investigators report a contraction of the intestinal strip when histamine is applied.

Another substance that must be considered in this work, and I am sure that Dr. Rehfuss has it in mind, is choline. Dr. Carlson and Dr. Mulinos studied this substance a number of years ago and came to the conclusion that choline was not a gastro-intestinal hormone. I should like to ask Dr. Rehfuss whether he has studied the effect of his extracts on blood pressure, or if he believes his extracts may have some choline in them. In the secretin and cholecystokinin preparations, I am quite certain that they do not contain choline. I have recently divided gastro-intestinal motility on a functional rather than a descriptive basis and have divided it, therefore, into two types: the motility of the propulsive and of the nonpropulsive type. Most of the drugs that the pharmacologists study augment the non-propulsive type of activity. Hypertonic salt solution intravenously is the best agent for increasing the propulsive type of motility in the small intestine that I have tried. In work on the action of cholecystokinin on the intestine in Thiry fistula animals, I observed sometimes an increase in motility, sometimes no change, and sometimes a decrease. I am at a loss to explain the variation.

DR. DANIEL N. SILVERMAN, New Orleans: I have been particularly interested in the question of hydrogen ion concentration of duodenal contents and relationship to motility and secretion. In 1924 my associates and I reported experiments done in a unique case. A man with a duodenal fistula, which was established at the junction of the first and second portion, had determinations made with the electrode inserted into the fistula. These studies were made during the fasting state and during digestion after the administration of various types of food substances. We found that there is such a distinct variation between the hydrogen ion concentration of the duodenum and in duodenal contents extracted through a duodenal tube that we were led to believe that it is very difficult to determine what is going on with reference to the relationship between duodenal secretion and its reaction, and stomach secretion, by the use of tubes placed in the duodenum. For instance, the variations in the duodenal contents of fasting or during digestion in this fistula case (which showed a normal gastric secretion, by the way) were small, the p_H being not more acid than 5.9, more alkaline than 8, and these figures were not affected by fats, carbohydrates or protein. In contrast to this, both McClendon and Okada showed that the p_H of duodenal contents may run as acid as approximately 4. In their study of about fifteen normal persons McClendon, using the duodenal tube, showed that the acidity may even approach the gastric acidity as high as 2.5. Boyden showed various stimuli that, synchronous with the gallbladder contraction, there was a gastric contraction, which is quite significant and confirmatory of the work of Dr. Rehfuss. In the light of our own experiments the question arises as to just how the administration of these bile salts acts. From the observations with reference to hydrogen ion concentration there is a question whether the stimulation of the secretory mechanism, especially the pancreas, might have something to do with this factor of contraction. There is a definite relationship between the hydrogen ion concentration of the duodenum and the concentration of the pancreatic enzymes in the duodenum. In an examination of a group of normal individuals and in those with cholecystitis and ulcer syndromes with the duodenal contents becoming distinctly acid, any degree of acidity beyond neutral, a p_H of 7, there was automatically an inhibition of the activity of these enzymes, although the duodenal contents were brought up to a uniform p_H of 8.2. I believe that this observation is of considerable significance. I disagree that a method which estimates one particular enzyme, such as the lecithin test for fat or Bassler's test for amylase, is a fair criterion of the pancreatic function. We find that there is a qualitative as well as a quantitative relationship between the three enzymes of the pancreas.

DR. SEIZABURO OKADA, Nagoya, Japan: I will try to present a report which is related to the paper of Dr. Rehfuss. My associates and I refined a substance from spinach and named it "spinacin." We purified by the same method various tissue extracts and investigated the action of these substances on the gastro-intestinal function. We found that spinacin, histamine and extracts of various tissues have a similar action on the gastro-intestinal function. From chemical, physiologic and pharmacologic aspects this effect is due to iminazol derivatives. The conclusions are as follows: An increase in the gastric secretion can be accomplished in cases of hypochlorhydria by systematic spinacin treatment. In cases of achylia reactive to histamine, free hydrochloric acid can be recovered, as a rule, after systematic treatment with spinacin. Histamine refractory cases show various results. In some, free hydrochloric acid is found in the breakfast fractions; in others no hydrochloric acid was detected, in spite of energetic treatment. Some cases of cancer of the stomach with refractory histamine reaction showed free hydrochloric acid in the breakfast fractions after treatment with spinacin. The increased secretion persists, as a rule, after spinacin is withdrawn. Systematic treatment with spinacin increases tonicity and movements of the stomach and intestine so that the sense of distention of the stomach and intestine, swelling and tympanites, nausea and vomiting of pregnancy, and singultus disappear and the patients display a good appetite and gain in weight. These effects are especially advantageous in chronic diseases such as tuberculosis and in recovery from febrile disorders. Cases of anemia showed an increase of the red blood cells, hemoglobin, reticulocytes and eosinophils.

DR. ROBERT KAPSINOW, Lafayette, La.: Did you find any change in blood concentration when using histamine, like that used from the vegetable source?

DR. OKADA: Yes, I did.

DR. MARTIN E. REHFUSS, Philadelphia: Professor Okada's paper should have been on the regular list and it is greatly appreciated by the members of the section. Dr. Ivy's criticism has been constructive because it is exactly what was expected. I am convinced, however, that there is something besides histamine. Blood pressure experiments were not done but the same histamine was used and it increased the gastric secretion. On one occasion the question was gone into further and histamine

was reasonably ruled out. One of the most important things in all the experiments was the p_H. It was absolutely necessary to control this factor. My associates and I never began or ended an experiment without determining the p_H because it was possible with the slightest change of p_H to change the beat of the gastric antrum and sometimes to destroy it altogether or stimulate it and bring it back. That is one of the most dramatic things, when one realizes that this excised muscle may be beating two days after the death of the animal; that makes one realize how significant the result might be. Dr. Thomas felt that the study of the surviving muscle was accompanied with fewer technical difficulties than the various intestinal loops. We found this curious thing, that streptococcic toxin, diphtheria toxin and tetanus toxin will produce a definite effect in the absence of any change in the p_H on the excised muscle. That is rather interesting because many toxic conditions are associated with spasticity. There is an enormous amount of work to be done on the question of gastro-intestinal motility and the secretory function cannot be divorced altogether from the motor function.

Clinical Notes, Suggestions and New Instruments

ANEMIA OF PREGNANCY WITH ENLARGEMENT OF THE SPLEEN

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Surgeon-in-Charge, Penn Hospital

Anemia of pregnancy appears to be a comparatively rare disease. A search of the literature available reveals the fact that very few cases have been reported, and among the few there seems to be considerable variation with regard to both the clinical symptoms and the appearance of the blood pictures.

Rowland[1] divides these cases into two groups: hematologically primary and hematologically secondary. He reported two cases in 1924 and has reported four cases since that time. Larrabee[2] has reported seventeen cases of anemia of pregnancy with the blood picture of a secondary anemia. A palpable spleen was present in two cases. There were two atypical cases in this series, one of which cleared up only after splenectomy, repeated blood transfusions having failed. Birdsong, Hulbert and Welchell have reported one case of splenic anemia and pregnancy.

The symptoms are described by Rowland as follows: The onset of the disease is insidious; it appears in the latter weeks of pregnancy and is frequently not recognized until the puerperium. Usually, however, there are antepartum symptoms, such as weakness, breathlessness on exertion, palpitation, headaches, dizziness, some edema of the feet, and occasionally an associated definite toxemia of pregnancy with albuminuria and hypertension. On account of the toxemia, the anemia may be overlooked if the blood is not examined. Labor may come on prematurely and is relatively painless. Postpartum bleeding is scant. Stillbirth may occur, but a living child does not share in the anemia and develops normally. Labor aggravates the anemia. The patient may go into collapse at once after parturition, if the anemia is quite marked. Typically, however, there is a rapid progression in the anemia in the first week or two following delivery. At times, the course is quite slow, so that a serious degree of anemia is recognized only after two months or more of supposedly simple delay in convalescence and returning strength.

The etiology of the condition is obscure. Hemorrhage and damage to the blood-forming organs by infection have been suggested, but in the case reported here and in cases of Larrabee and of Rowland these two factors seem to be of little consequence. Adler believes that the condition occurs in women who are predisposed and that true pernicious anemia is rarely seen in pregnant women.

The blood picture in the primary group is that of pernicious anemia with an occasional aplastic or atypical form, as reported by Larrabee. The blood picture in the second group is that of a secondary anemia. Esch (1917) stated that no case of the secondary type ever passes into the pernicious group.

The following case appears to belong to the secondary group, the blood picture being that of a secondary anemia and the clinical signs and symptoms those of a profound degree of the disease, with marked enlargement of the spleen. The onset was gradual, eight or ten days after a normal delivery, and was not recognized until that time. In looking back over the antepartum history, one sees that the symptoms fit nicely into Rowland's description as quoted, so that the condition in all probability originated from six to eight weeks before delivery.

REPORT OF CASE

Mrs. L. E., aged 28, reported for examination and prenatal care for her third pregnancy. She stated that she was in good health at this time and had not experienced any unusual symptoms. She had lost her first baby, at which time she had had albumin in the urine. Her second pregnancy was normal in every respect.

She was rather obese, of healthy appearance and good color. The systolic blood pressure was 128 and the diastolic 80. The pulse (rate 84 per minute) was regular and of good volume. The heart sounds were normal and the lungs showed no evidence of pathologic change. The patient had a definite enlargement of the thyroid, which, she stated, had become more noticeable during the last two months. The uterus was enlarged to the size of a five months' pregnancy. The urine was clear and showed no albumin and no sugar.

Successive examinations at intervals of from two to three weeks revealed no unusual symptoms, but about one month before delivery the patient complained of marked dyspnea, palpitation of the heart, nervousness and weakness. On examination she appeared quite breathless and excited. The pulse rate was 124 per minute and the blood pressure 140 systolic, 90 diastolic. The urine showed no evidence of albumin. It was felt that the patient was suffering from an increased activity in the thyroid gland, and she was advised to rest. She was placed on oridine tablets, 0.04 Gm., three times a day.

She was given 1½ grains (0.1 Gm.) of phenobarbital twice a day. Immediate improvement was noted and she did very well for the next few days. About two weeks before delivery she was still somewhat nervous and suffered attaks of palpitation of the heart. The pulse rate remained about 120 per minute and the blood pressure 130 systolic, 80 diastolic. Urinalysis still showed no evidence of albumin. The patient was advised to remain under close observation and was admitted to the hospital for this purpose. She was kept in bed and given 10 minims (0.6 cc.) of compound solution of iodine three times a day and 10 minims of tincture of digitalis three times a day after eating. Apparently she was unable to tolerate the compound solution of iodine, as she complained of gastric distress and vomited each time after taking it. Oridine was substituted, and improvement was again noted. After four days in the hospital she was feeling much better and expressed a desire to return home. Her pulse was 96, temperature 98.8 F., and respirations 20. She was allowed to return home and at 3 o'clock the following morning was readmitted, labor having begun. Delivery was short and relatively easy. There was very little postpartum bleeding and the patient's condition seemed to be very good. The baby was quite normal and weighed 4 pounds 13¼ ounces (2,190 Gm.).

On the second day post partum the patient complained of neuritic pains in her shoulders and neck and of a slight headache. She appeared to be in very good condition otherwise. The third day she developed a slight cough, which persisted until the fifth day, at which time a slight trace of albumin appeared in the urine. The pulse was 120, the temperature 100.8 and the respiration rate 24. The lochia was very scant but otherwise normal. By the eighth day post partum her condition had become considerably worse. The clinical picture was one of a profound anemia. The lips were pale, the skin was a distinct lemon yellow, and the patient was very listless, tired and short of breath. The temperature and pulse had been steadily rising, and it was felt that sepsis had occurred. The uterus was showing satisfactory retrogression; however, there was nothing unusual about the character of the lochia and the patient had not suffered chills at any time. The white cell count at this time was 8,800. The urine showed a slight trace of albumin

1. Rowland, V. C.: The Pernicious or Hemolytic Anemia of Pregnancy, J. A. M. A. **82**:372 (Feb. 2) 1924.
2. Larrabee, R. C.: Am. J. M. Sc. **170**:371 (Sept.) 1925.

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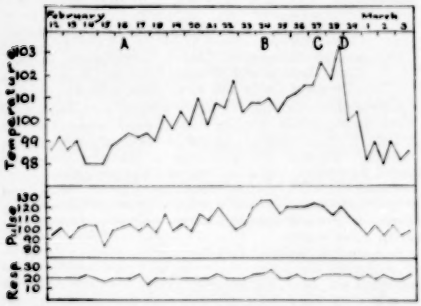
but otherwise was normal. Nine hundred cubic centimeters of saline solution and dextrose was given intravenously, and she seemed much better for a few hours. Treatment with desiccated hog stomach was also begun. At this time the red cell count was 2,600,000; hemoglobin, 40 per cent, and there was some poikilocytosis, though not marked. There was no evidence of pernicious anemia in the blood picture. On examination of the abdomen at this time a greatly enlarged spleen could be palpated, extending to a point 3 inches below the umbilicus. By the tenth day the patient was much worse; the enlarged spleen was much more definite, and the possibility of Banti's disease was considered. The blood picture was as follows: leukocytes, 9,400; basophils, 0; eosinophils, 2 per cent; neutrophils, 63; lymphocytes, 33; megalocytes, 0; erythrocytes, 2,300,000; hemoglobin, 42 per cent; color index, 0.9, and blood platelets, 50,000.

The patient's condition had become so alarming that she was immediately given 600 cc. of citrated blood by the Hartman method. Improvement was noted at once, and two days later a second transfusion of 800 cc. was done. At this time her condition was critical; the temperature was 103.4 F., pulse 110 and respiration rate 22. Following the second transfusion, progress was remarkable. The temperature dropped to normal within two days; the pulse was 90 and respirations were 20. Her color was greatly improved and her shortness of breath was gone. She was given liver extract, 2 cc. intramuscularly, each day for the next five days, after which one vial three times daily was given orally. From this time on recovery was



Rapid recovery following blood transfusion: *A*, day of delivery; *B*, intravenous dextrose, 5 per cent, and saline solution, 900 cc.; *C*, transfusion of citrated blood, 600 cc.; *D*, transfusion of citrated blood, 800 cc.

uneventful. The spleen gradually became smaller and ten days later was barely palpable. A corresponding improvement was noted in the patient's general condition. She was discharged from the hospital on the twenty-fifth day.

The patient was seen at regular intervals from this time on and remained in good health. Two months after she left the hospital the red cell count was 4,200,000; hemoglobin, 75 per cent, and color index, 0.9. The red blood cells were microscopically normal. Three months after discharge from the hospital the red cell count was 4,800,000; hemoglobin, 80 per cent, and color index, 0.9. During this time the patient had remained on liver extract therapy, but this was now discontinued. Six months after she left the hospital the complete blood count was as follows: leukocytes, 6,500; basophils, 0; eosinophils, 2 per cent; neutrophils, 60; lymphocytes, 35; monocytes, 3; erythrocytes, 4,400,000; hemoglobin, 85 per cent, and color index, 0.9.

SUMMARY

The clinical picture in a case of anemia of pregnancy with marked enlargement of the spleen suggested a primary anemia, but the blood picture was that of the secondary type.

The gradual onset of the disease and the presence of a goiter with definite signs of hyperthyroidism resulted in the condition not being recognized until eight days after delivery.

Recovery was prompt and permanent following blood transfusions and the administration of liver extract.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

P. N. LEECH, Secretary.

NEOCINCHOPHEN (See New and Nonofficial Remedies, 1932, p. 131).

Neocinchophen-Lederle.—A brand of neocinchophen-N. N. R.

Manufactured by Lederle Laboratories, Inc., Pearl River, N. Y. No U. S. patent or trademark.

Tablets Neocinchophen-Lederle, 5 grains.

REPORTS OF THE COUNCIL

THE COUNCIL HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORT.

P. N. LEECH, Secretary.

ERGOFORTIS NOT ACCEPTABLE FOR N. N. R.

"Ergofortis" is the proprietary name under which Burrough Bros. Manufacturing Co., Baltimore, markets a liquid preparation of ergot stated to contain "in each cc. a specific ergot alkaloidal activity corresponding to 0.625 mg. of Ergotamine." According to the information submitted by the firm for the Council's consideration, the product does not possess sufficient originality to justify the use of a proprietary name. The claim is made, in an advertising circular, that Ergofortis embraces "the newest scientific conception of an ideal liquid preparation of ergot"; the superlatives are not justified. The implication that the product is something new is an exaggeration, since the process by which it is stated to be prepared is simply a modification of an official process by which the original percolate, which is rich in alkaloids, is discarded.

In the circular, much is made of the claim that the product is "25% more potent than the usual fluid extract." This may be quite true; but it is hardly a claim of distinction. The Council has frequently held that a mere increase in potency is by no means always desirable, and in this case it is certainly not a convincing argument for the use of a proprietary name.

In the circular there is a long quotation from *American Medicine* (May, 1930) which contains incorrect and misleading statements. It is stated that ". . . on the basis of clinical experiments the American Association of Obstetrical, Gynecological and Abdominal Surgery came to the conclusion that market extracts of ergot were valueless. . . ." This is not correct. A report was prepared by Dr. Ill making such a statement. The other members of the committee claimed that they merely signed the report, which was never officially presented to the American Association of Obstetrical, Gynecological and Abdominal Surgery. Federal officials were present at the meeting to discuss the report but it was not brought up. (Articles bearing on this report appeared in THE JOURNAL, Sept. 6, 1930: Ambruster, Rusby—and Ergot, p. 722; The Ambruster Ergot Situation, p. 730.)

Further on in the circular occurs a statement regarding the interference of amines in the standardization of ergot, based on the work of Thompson. This has never been confirmed by other workers and, it is understood, has been practically withdrawn recently by Thompson himself. The statement on page 4, that Ergofortis is "protected from deterioration by the newly developed method" is subject to serious question. The Council's referee attended a recent meeting at which representative manufacturers and the federal authorities, together with prominent pharmacists, agreed that there is no known method that can be depended on to protect a fluid preparation of ergot from deterioration. It was agreed that certain factors seemed to aid, such as a degree of acidity, complete filling of the bottle, and protection from heat, light and cold; but even when these factors are taken care of, it was agreed that a certain amount of deterioration takes place. On page 5 of the firm's circular

occurs the following paragraph concerning the therapeutic use of Ergofortis: "Emmenagogue and Uterine Tonic, for the Control of Metrorrhagia and other menstrual disorders. . . ." This is, of course, entirely too sweeping.

The Council concurred in these objections to Ergofortis and to the advertising circular just discussed. The firm of Burrough Bros. Manufacturing Co. was informed of the objections which the Council had found to Ergofortis and to the advertising circular. In reply the firm made no effort to meet these objections but stated that ". . . so far as we are concerned, the Ergofortis matter is closed." The Council, therefore, declared Ergofortis unacceptable for New and Nonofficial Remedies because it is marketed under an unacceptable proprietary name (conflict with rule 8) with incorrect and misleading claims (conflict with rules 5 and 6).

Committee on Foods

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

MELLIN'S FOOD
For Infants and Invalids

Manufacturer.—Mellin's Food Company of North America, Boston.

Description.—A dried extract produced by an infusion of wheat flour, wheat bran and malted barley admixed with potassium bicarbonate; essentially maltose, dextrins, proteins and mineral salts for the modification of milk for infants and invalids.

Manufacture.—Definite quantities of wheat flour and bran are added to an infusion of malted barley and water. The mixture is heated and maintained at a temperature favorable for action of the malt diastase until the starch is converted to maltose and dextrins. The solution of the soluble material is filtered, concentrated in "vacuum" pans and dried on heated cylinders. The dried solids are reduced to a fine powder, admixed with a definite proportion of potassium bicarbonate, and automatically packed in bottles.

Analysis (submitted by manufacturer).—

	per cent
Moisture	5.6
Ash	3.9
Fat (Roese-Gottlieb method)	0.2
Protein (N × 6.25)	10.3
Reducing sugars as maltose	58.9
Dextrins (by difference)	20.7
Crude fiber	0.2
Total carbohydrates other than crude fiber (by difference)	79.6
Potassium (K)	1.78
Sodium (Na)	0.08
Calcium (Ca)	0.02
Magnesium (Mg)	0.09
Iron (Fe)	0.005
Copper (Cu)	0.0009
Manganese (Mn)	0.0003
Chlorine (Cl^-)	0.03
Phosphorus (P)	0.32

Calories.—3.6 per gram; 102 per ounce; 1 level tablespoonful = 25 calories.

Claims of Manufacturer.—The product is especially designed for use as a carbohydrate supplement to milk for infants and invalids.

ELITE BRAND UNSWEETENED STERILIZED EVAPORATED MILK
KIT BRAND EVAPORATED MILK STERILIZED UNSWEETENED

Manufacturer.—The Page Milk Company, Merrill, Wis.

Description.—This canned unsweetened evaporated milk is the same product as Page Evaporated Milk, Sterilized Unsweetened (THE JOURNAL, May 30, 1931, p. 1872).

BREAKSTONE'S CREAM CREST CREAM CHEESE
(Made from Pure Pasteurized Cream)
DAISY BRAND PASTEURIZED CREAM CHEESE

Manufacturer.—Breakstone Brothers, Inc., New York.

Description.—"Cream cheese" prepared from pasteurized cultured sweet cream seasoned with salt.

Manufacture.—Sweet cream from tuberculin tested cows conforming with the Rules and Regulations of the New York State Board of Health is tested for milk fat, solids and acidity, which latter must be under 0.12 per cent as lactic acid. The cream is pasteurized, homogenized, and cooled to 21 C. and after the addition of salt is cultured with Streptococcus lacticus. After twenty-four hours the mixture is transferred to twelve quart bags and placed in chilled cheese vats to drain, after which the cheese is packed by machine in tin foil lined boxes and kept in refrigerators until distributed.

Analysis (submitted by manufacturer).—

	per cent
Moisture	54.6
Ash	1.0
Fat (ether extract)	37.4
Protein (N × 6.38)	6.0
Lactose (by difference)	1.0

Calories.—3.6 per gram; 102 per ounce.

Claims of Manufacturer.—The cheese conforms to the United States Department of Agriculture Definition and Standard for cream cheese; it is for all table uses.

JELL-WELL GELATINE DESSERTS
(Strawberry, Raspberry, Cherry, Loganberry, Mint, Lime, Lemon and Orange Flavors; U. S. Certified Color and Fruit Acid Added)

Manufacturer.—Jell-well Dessert Company, Los Angeles.

Description.—These desserts contain sugar, gelatin, tartaric acid, U. S. Department of Agriculture certified color, and the following respective natural flavors: strawberry, raspberry, cherry, loganberry, mint, lime, lemon oil and orange oil.

Manufacture.—The sugar, flavor and color are mixed and partially dried; the gelatin and acid are added and mixed. The mixture is screened and automatically packed in cartons containing paper inserts.

Analysis (submitted by manufacturer).—

	per cent
Moisture	2.7
Total ash	0.2
Salt free ash	0.1
Fat (ether extract)	0.0
Protein (N × 5.53)	8.0
Reducing sugars	0.0
Sucrose (by difference)	87.2
Tartaric acid	1.9

Calories.—3.8 per gram; 108 per ounce.

Claims of Manufacturer.—These desserts are for all table uses.

PRUDENCE LAMB STEW

Manufacturer.—Boston Food Products Company, Boston.

Description.—Canned lamb stew containing lamb meat, potatoes, carrots, peas and onions; seasoned with salt and pepper.

Manufacture.—United States Department of Agriculture inspected lamb is trimmed of gristle, skin and sinews, placed in cold water and boiled until tender. It is taken from the kettle, again overhauled for skin, gristle or sinews, and then diced.

The vegetables used are pared by machine, washed, sliced, and in definite proportions admixed with the cooked lamb. The mixture is filled into cans and processed.

Analysis (submitted by manufacturer).—

	per cent
Moisture	78.7
Total solids	21.3
Ash	1.5
Fat (ether extract)	4.5
Protein (N × 6.25)	6.8
Reducing sugars before inversion as dextrose	0.8
Sucrose (copper reduction method)	0.3
Starch (acid hydrolysis method)	4.7
Crude fiber	0.4
Carbohydrates other than crude fiber (by difference)	7.5

Calories.—1.0 per gram; 28 per ounce.

Claims of Manufacturer.—This lamb stew is for all table uses.

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M. D. CO. POWDERED MALT EXTRACT FOR MILK

Manufacturer.—Malt-Diastase Company, Brooklyn.

Description.—Spray dried powdered malt extract, diastatically active; contains vitamins B and G.

Manufacture.—Selected barley malt is crushed, admixed with warm water and agitated for sufficient time to permit conversion of starches almost completely to maltose. When tests indicate that the starches have been properly converted, the liquid is drawn off from the mash, strained and concentrated in "vacuum" pans. The concentrated liquid is run into tanks, brought to a definite temperature and sprayed into a drying chamber in which the temperature does not exceed 80 C. Washed air is used in the chamber. All temperatures during the manufacturing process are kept sufficiently low so as not to destroy the diastatic value of the malt. The dry powder is automatically packed in cartons.

Analysis (submitted by manufacturer).—

	per cent
Moisture	2.3
Ash	1.9
Fat (ether extract)	0.1
Protein (N × 6.25)	9.1
Reducing sugars as anhydrous maltose	80.5
Acidity as lactic acid	1.9
Dextrins (by difference)	4.3
Diastatic power ..... 10 units (One gram Powdered Malt Extract converts 10 Gm. starch in accordance with the method prescribed in U. S. Pharmacopeia X)	
Iron (Fe) 0.007%	Potassium (K) 0.23%
Aluminum (Al) 0.005%	Sulphur (S) 0.13%
Calcium (Ca) 0.04%	Phosphorus (P) 0.34%
Magnesium (Mg) .. 0.14%	Chlorine (Cl) 0.07%
Sodium (Na) 0.08%	

Calories.—3.9 per gram; 111 per ounce.

Vitamins.—The method of manufacture is protective of the natural vitamins B and G of the malt.

Claims of Manufacturer.—This malt extract, rich in vitamins B and G, is especially intended for admixture with milk for use in the diet of invalids, convalescents, children, nursing mothers and the aged; it has starch digestive properties.

COLONIAL FLOUR (BLEACHED)

Manufacturer.—Blish Milling Company, Seymour, Ind.

Description.—An "all purpose" "short patent" flour milled from soft wheat; bleached.

Manufacture.—Selected soft Indiana wheat is cleaned, scoured, tempered and milled by essentially the same procedures as described in THE JOURNAL, June 18, 1932, page 2210. Chosen flour streams are blended and bleached with a mixture of benzoyl peroxide and calcium phosphate (¼ ounce per 196 pounds) and with nitrogen trichloride (1/14 ounce per 196 pounds).

Analysis (submitted by manufacturer).—

	per cent
Moisture	12.3
Ash	0.37
Fat (ether extraction method)	0.9
Protein (N × 5.7)	8.5
Crude fiber	0.2
Carbohydrates other than crude fiber (by difference)	77.7
Acidity as lactic acid	0.09

Calories.—3.5 per gram; 99 per ounce.

Claims of Manufacturer.—This flour is intended for all baking uses, but especially for cakes and pastries.

GORMAN'S RYE BREAD SWEDISH RY-PAN BREAD

Manufacturer.—Gorman's Bakery, Inc., Central Falls, R. I.

Description.—Rye breads made by the straight dough method (method described in THE JOURNAL, March 12, 1932, p. 889); prepared from patent and clear wheat flours, rye flour, water, salt, lard and yeast, and refiners' syrup (only in Swedish Ry-Pan Bread) and malt extract (only in Gorman's Rye Bread).

Analysis (submitted by manufacturer).—

	per cent
Moisture (entire loaf)	36.1
Ash	1.8
Fat	3.0
Protein (N × 6.25)	9.2
Crude fiber	0.5
Carbohydrates other than crude fiber (by difference)	49.4

Calories.—2.6 per gram; 74 per ounce.

Claims of Manufacturer.—Rye breads for all table uses.

IXL FAMILY FLOUR (BLEACHED)

Manufacturer.—Saxony Mills, St. Louis.

Description.—Hard winter wheat "long patent" flour; bleached.

Manufacture.—Selected hard winter wheat is cleaned, scoured, tempered and milled by essentially the same procedures as described in THE JOURNAL, June 18, 1932, page 2210. Chosen flour streams are blended, bleached with nitrogen trichloride (1/6 ounce for 196 pounds) and with a mixture of benzoyl peroxide and calcium phosphate (1 part to 50,000 parts of flour).

Analysis (submitted by manufacturer).—

	per cent
Moisture	12.0 –14.0
Ash	0.40– 0.48
Fat (ether extraction method)	0.8 – 1.2
Protein (N × 5.7)	10.0 –12.0
Crude fiber	0.3 – 0.5
Carbohydrates other than crude fiber (by difference)	76.5 –71.9

Calories.—3.5 per gram; 99 per ounce.

Claims of Manufacturer.—The flour is designed for home bread baking.

FAIRWAY BRAND WHITE TABLE SYRUP
(85 Per Cent Corn Syrup, 15 Per Cent Rock Candy Syrup)

Packer.—Wheeler-Barnes Company, Minneapolis.

Distributor.—Twin Ports Wholesale Grocer Company, Superior, Wis.

Description.—Table syrup; corn syrup base (85 per cent) with rock candy syrup (15 per cent); the same as White Oak Brand Crystal White Syrup (85 Per Cent Corn Syrup, 15 Per Cent Rock Candy Syrup) (THE JOURNAL, Oct. 15, 1932, p. 1353).

DR. P. PHILLIPS FLORIDA FANCI-CUT GRAPEFRUIT AND ORANGES
(With Added Cane Sugar)

Manufacturer.—Dr. P. Phillips Company, Doctor Phillips, Fla.

Description.—Canned mixture of sliced Florida grapefruit and oranges sweetened with added sucrose and retaining in large measure the original natural vitamin content.

Manufacture.—The manufacture and canning are essentially the same as for Dr. P. Phillips Florida Fanci-Cut Grapefruit Slices and Dr. P. Phillips Florida Fanci-Cut Orange Slices (THE JOURNAL, Nov. 19, 1932, p. 1781; Dec. 17, 1932, p. 2113).

WILSON'S UNSWEETENED STERILIZED EVAPORATED MILK

Manufacturer.—The Indiana Condensed Milk Company, Indianapolis.

Description.—An unsweetened sterilized evaporated milk.

Manufacture.—The milk is collected and concentrated according to standard procedures (THE JOURNAL, April 16, 1932, p. 1376).

Analysis (submitted by manufacturer).—

	per cent
Moisture	73.9
Ash	1.5
Fat	7.8
Protein (N × 6.25)	6.9
Lactose (by difference)	9.9

Calories.—1.4 per gram; 40 per ounce.

Vitamins and Claims of Manufacturer.—See announcement of acceptance of Evaporated Milk Association Educational Advertising (THE JOURNAL, Dec. 19, 1931, p. 1890).

NONE SUCH BRAND TOMATO JUICE

Manufacturer.—Loudon Packing Company, Terre Haute, Ind.

Distributor.—Durand-McNeil-Horner Company, Chicago.

Description.—Pasteurized tomato juice with a small amount of added salt; retains in high degree the vitamin content of the raw juice. The same as Loudon Brand Tomato Juice (THE JOURNAL, June 25, 1932, p. 2289).

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, DECEMBER 31, 1932

GASTRO-INTESTINAL SYMPTOMS OF HYPERTHYROIDISM

The symptomatology of hyperthyroidism includes among the unusual manifestations of this condition an abnormal appetite. A somewhat less frequently reported symptom is diarrhea. The increased liberation of thyroid hormone in the fundamental disorder inevitably brings about a stimulation of the characteristic metabolism of the body cells, resulting in the well known augmentation of the basal metabolic rate. The latter tends to become roughly proportional to the severity of the disease. The excessive combustion obviously calls for a higher intake of food fuel to avert depletion of the body reserves. It is evident that unless the appetite responds in the direction of inducing greater food intake the energy balance and, in the long run, the body weight will be adversely affected. As a consequence, the energy requirement, judged by the expenditure of an adult patient, may become as large as 5,000 calories a day. It is interesting to learn, therefore, that the organism possesses a directing mechanism that tends to avert the untoward conditions. Hunger sensations are a well known accompaniment of the contractions of the empty stomach. These movements, and the attendant sensations of hunger, can be temporarily appeased by the ingestion of food.

A condition closely simulating clinical hyperthyroidism can be developed in experimental animals by feeding relatively large doses of thyroid material. After a hyperthyroidism is induced in this way, Fetter and Carlson [1] have observed a definite increase in gastric motility; that is, an increase in the so-called hunger contractions. From these studies in the Department of Physiology at the University of Chicago, they report that the doses of thyroid used (0.4 Gm. per kilogram of body weight) brought on symptoms similar to those seen in the spontaneous hyperthyroidism of man, including an increase in the basal metabolic rate. After the thyroid feeding is discontinued there is a return to normal gastric function, although this may be greatly delayed in some instances.

During the period of thyroid feeding, the emptying time of the stomach is decreased and a barium meal passes more rapidly through the small intestine. After the administration of thyroid is stopped, the speed of the barium meal through the digestive tract returns to its former rate. Fetter and Carlson point out that, since diarrhea is a frequent symptom of hyperthyroidism in man, one might expect to find that the barium residue would go through the colon at a greater rate of speed than the normal, so that water absorption would be prevented. This expected condition was actually observed in some instances. The explanation of the increased intestinal activity is not immediately at hand. The Chicago physiologists suggest that it may lie in a change in gastric secretion. As gastric acidity is lessened in hyperthyroidism, the assumption is made that protein food is probably not as well digested as in the normal dog, and larger pieces of undigested food might pass into the small intestine, acting as a stimulus to peristaltic activity. One naturally inquires as to the possible involvement of nervous mechanisms in the gastro-enteric anomalies of hyperthyroidism. The attendant diarrhea has actually been attributed by Eppinger and Hess [2] to overactivity of the vagus nerve. Observations by Fetter, Barron and Carlson [3] on vagotomized animals also show an increase in gastro-intestinal activity on the administration of thyroid. They therefore regard it as clear that the influence of the thyroid on gastro-intestinal motility is largely if not wholly independent of the possible influence of the thyroid hormone on the gastro-intestinal vagus mechanism.

1. Fetter, Dorothy, and Carlson, A. J.: I. The Effect of Experimental Hyperthyroidism on Gastro-Intestinal Motility, Am. J. Physiol. **101**: 598 (Sept.) 1932.

2. Eppinger and Hess, Ztschr. f. klin. Med. **68**: 231, 1909.

3. Fetter, Dorothy; Barron, Louis, and Carlson, A. J.: II. The Effect of Induced Hyperthyroidism on the Gastro-Intestinal Motility of Vagotomized Dogs, Am. J. Physiol. **101**: 605 (Sept.) 1932.

PUBLIC HEALTH BUDGETS

The importance of public health has been expressed in a number of slogans, most of them based on the ideas that health is wealth and that public health is purchasable. Probably most persons will subscribe in the abstract to the dictum that good health is necessary for human happiness. Now there is virtually universal agreement that economy in government is going to be necessary for some time to come. How much, then, shall be spent for public health?

Two types of activity are pursued for the health of the public: preventive medicine and medical care of the sick. The medical care of the sick poor is an immediate matter. Activities for the prevention of disease present a different problem. It has been customary to divide medicine into curative and preventive. Superficially this may be a good division, but much so-called curative medicine is preventive in effect. The treatment in typhoid, heart disease or cancer is

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intended to procure recovery from the acute illness and also to prevent untoward sequelae or recurrence. To this extent the practicing physician has always been, still is and always must be a practitioner of preventive as well as curative medicine. Another type of preventive medicine, namely, the hygienic supervision of the lives of apparently healthy persons, has not been undertaken as extensively as now seems desirable by the private practicing physician. As a result, this field has been largely preempted by public health workers.

The care of the public health has in the last fifty years achieved tremendous progress. Doctors initiated public health movements in primitive communities. Many of the discoveries on which preventive work is based were contributed by physicians. Doctors conceived the antituberculosis movement; medical societies in many instances petitioned state legislatures for the creation of state boards of health; the medical profession has initiated in the past and continues to propose constructive legislation for the public health. The medical profession has not been content with raising the standards of medical education, improving the quality of proprietary medicines, fighting quacks within its own ranks as well as without, and aiding in the development of the modern hospital but has taken an active part in creating organizations, both government and voluntary, designed to improve the public health. Then, unfortunately, it has too often allowed these organizations to become alienated from medical guidance and advice. In consequence, some workers in the field of public health have forgotten or overlooked the importance of the medical profession. They have designated themselves as specialists and their field of endeavor as a specialty, but they have failed to recognize that public health is a specialty of medicine. True, a well rounded public health program requires nurses, engineers, technicians and educators, but all these must be guided by underlying medical principles. Significantly, perhaps partly as a result of economic stringency, now that adequate budgets are hard to get and public services which have been regarded as essential because long established are threatened, workers in public health are turning back to the medical profession.

The medical profession has always stood, and still stands, in favor of public health work of the right kind, properly conceived, correctly organized and competently directed for the better health of the community. The medical profession does not feel obligated to endorse unwise, visionary or inefficient projects merely because they are launched in the name of public health. Because it does not hesitate to speak out against abuses, it has been unjustly accused of obstructing progress. But all motion is not necessarily progressive. In times of economic stress, public health work is of special importance. If epidemic scourges such as typhoid, diphtheria, yellow fever, malaria and smallpox, held in check by preventive measures, were to be added to our financial difficulties at this time, the result might well be disastrous. The absence of epidemic plagues has been one of the principal contributing factors to low depression death rates.[1]

Essential services for the public health must be maintained. No community can afford to skimp in the operation of water purification plants, nor can it let down the bars to milk supplies of questionable purity.[2] Epidemics of diphtheria, smallpox or other controllable diseases should not be permitted to complicate the sufficiently pressing problems of the unemployed. Essential services must be maintained even while budgets are being deflated. Moreover, restriction of budgets should not permit loss of well trained and well qualified personnel.

Now that public health workers the country over are tending to recognize the importance of medical guidance and are making efforts to get both individual preventive and curative medicine back into the hands of physicians, the medical profession, as pointed out in THE JOURNAL recently,[3] may take its rightful place as the leader of public health endeavor. This will be accomplished most effectively through local medical societies.

MINERALIZED MILK

A popular American textbook on dietotherapy [1] ventures the statement that "milk has never been accorded adequate place in the American dietary." Aside from the high quality of its proteins, its richness in mineral elements and certain vitamins, and the usual ready utilization of its unique carbohydrate and fats, there are other factors of moment in dietetics. Milk can be rendered safer for general use by effective pasteurization without serious impairment of its nutritive value. Finally, milk has numerous culinary uses that make it a valued adjunct to cookery. Today, no one versed in the science of nutrition ventures, as did writers of somewhat earlier days, to designate milk as a "perfect food," however indispensable it may seem to be in early life. Sherman [2] has circumspectly designated it as "the most efficient of all foods in making good the deficiencies of grains and in insuring the all-around adequacy of the diet." Some authors compromise by calling milk the "most nearly perfect food."

Evidently these cautious pronouncements are intended to make allowance for certain shortcomings of milk. In a recent article [3] it is frankly admitted that, in spite of the exceedingly favorable attitude toward the nutritive value of milk, no one has been able, as far as is known, to rear a mammal from weaning to maturity

1. Depression Death Rates, editorial, J. A. M. A. **99**: 1354 (Oct. 15) 1932.
2. Bootleg Milk, editorial, J. A. M. A. **99**: 1606 (Nov. 5) 1932.
3. Child Health and the Depression, Current Comment, J. A. M. A. **99**: 1515 (Oct. 29) 1932.

1. McLester, J. S.: Nutrition and Diet in Health and Disease, Philadelphia, W. B. Saunders Company, 1931.
2. Sherman, H. C.: Chemistry of Food and Nutrition, New York, Macmillan Company, 1926, p. 551.
3. Kemmerer, A. R.; Elvehjem, C. A.; Hart, E. B., and Fargo, J. M.: The Nutritive Value and Efficiency of Mineralized Milk, Am. J. Physiol. **102**: 319 (Nov.) 1932.

on whole cow's milk alone. The anemia that develops in experimental animals under such conditions has prevented the use of an exclusive milk diet for studying its nutritive properties. It has long been known that milk is relatively poor in iron, an indispensable component of the blood pigment. The danger of insufficiency seems to be averted for the nursling, which comes into the world with a relative richness of iron stored in its body. The inability of milk to produce hemoglobin was always attributed to its low iron content, but Hart, Steenbock, Waddell and Elvehjem [4] demonstrated that milk is deficient also in copper. This element acts as a supplement to iron in the formation of hemoglobin and it also must be added to milk in order to prevent the development of anemia. Kemmerer, Elvehjem and Hart,[5] working with mice, and Skinner, Peterson and Steenbock,[6] working with rats, have demonstrated that the addition of traces of manganese to a diet of whole cow's milk supplemented with iron and copper has a favorable effect on growth.

Do these three mineral elements constitute all of the more serious deficiencies that deprive milk of a more perfect reputation as the ideal nutrient? This query has challenged investigators to examine the problem by studying the comparative nutritive value of milk supplemented with iron, copper and manganese in the form of suitable salts. When such "mineralized" milk was fed exclusively to two distinct species, the rat and the pig, remarkably satisfactory growth was achieved. The gains were also economical in terms of milk solids required per unit of increment in body weight. As Kemmerer, Elvehjem, Hart and Fargo point out, these results demonstrate further the excellent nutritive value of milk alone when specific inorganic deficiencies in milk are corrected. The investigators mention the fact that iron and copper do not need to be added to milk for new-born animals because there is a sufficient supply of these elements in the liver to counteract the deficiency in milk. The supply, however, varies in different species and in different animals of the same species. It is important to determine when the inorganic supplements should be added in order to give the best results. The destructive action of these elements on certain organic factors in the milk is another question that must be given consideration. The rapid growth resulting from the feeding of mineralized milk increases the requirement of other nutritive factors in the milk. If these factors are present in low amounts they may limit growth and development.

The quantities of the elements that insure the described nutritional advantages are seemingly insignificant. They were represented by approximately 17 mg. of iron, 0.17 mg. of copper and 0.13 mg. of manganese per liter of milk. The available facts of experiment are still too scanty to warrant the mineralization of milk for universal human consumption. Much remains to be learned and to be tested. A record of scientific progress is by no means a license to practical application. This warning needs to be uttered at a time when the consumer of milk is confronted with the possibilities of clarified, pasteurized and homogenized milk, irradiated milk, acidified milk, evaporated milk and dried milk; and with milk supplemented with iodine, iron, copper and manganese as well as a variety of vitamins. Even the cow is now being called on to "improve" her milk through the enforced intake of special rations. An older food chemist once designated this as "adulteration with the connivance of the cow."

4. Hart, E. B.; Steenbock, Harry; Waddell, J., and Elvehjem, C. A.: Iron in Nutrition, J. Biol. Chem. **77**:797 (May) 1928.
5. Kemmerer, A. R.; Elvehjem, C. A., and Hart, E. B.: Relation of Manganese to the Nutrition of the Mouse, J. Biol. Chem. **92**:623 (Aug.) 1931.
6. Skinner, Peterson and Steenbock: Biochem. Ztschr. **250**:392, 1932.

Current Comment

SODIUM THIOCYANATE (RHODANATE) AND THE THEORY OF AGGLOMERATION

Both chemical and medical periodicals of late have contained discussions concerning a theory of sleep and a method for the control of narcotic addiction, and even insanity. The theory and a treatment are advanced by Wilder D. Bancroft, professor of physical chemistry in Cornell University, at Ithaca, N. Y. Apparently Professor Bancroft conceives that these conditions are associated with some physical change in the cells of the brain in the nature of an agglomeration and that this physical change can be controlled by the administration of sodium thiocyanate or sodium rhodanate. The evidence thus far available seems to concern a few cases with apparent improvement after brief treatment. Physicians, of course, realize that it is the tendency of such cases to be cured temporarily by any treatment and that the difficulty in the situation arises in making them stay cured. It is conceivable that various types of mental defect may have remissions and numerous relapses. Evidence is now available in the office of the American Medical Association that Professor Bancroft has sent not only to physicians but also to a layman a circular reading as follows:

SUGGESTIONS TO PHYSICIANS

Sodium Rhodanate Merck is made and sold by Merck and Company, 161 Sixth Avenue, New York. It is the purest sodium thiocyanate on the market and is the only one that we recommend at present. The potassium salt must not be used. Sodium rhodanate should not be taken by anybody who is or has been tuberculous. People with weak hearts should take it only under close supervision by a physician.

In the case of sleeplessness due to irritated nerves we have had good results by giving one-half gram sodium rhodanate in a glass of water on two successive evenings, then twice a week for a while, dropping to once a week or once every ten days as seems desirable. Instead of weighing out half-gram lots, it is simpler to make up a ten per cent solution, in which case one teaspoonful is near enough to half a gram and can be given as a dose in a glass of water. It is better not to make up a solution containing more than one-quarter to one-half ounce sodium rhodanate at a time. One-quarter ounce will

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last one person nearly two months and the solution deteriorates slowly when exposed to light. Too large doses of sodium rhodanate will prevent sleep instead of encouraging it.

We would like to receive reports on successful and unsuccessful tests.

WILDER D. BANCROFT,
Ithaca, N. Y.

Is this not a peculiar document to emanate from a professor of physical chemistry in a leading university? Among the strange inroads now being made on the practice of medicine by those without training or legal authority to practice, this document assumes a peculiar place.

Association News

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts on Monday and Wednesday from 9:45 to 9:50 a. m. (central standard time) over Station WBBM (770 kilocycles, or 389.4 meters).

The subjects for the week are as follows:

January 2. No broadcast.
January 4. Chilblains.

There is also a fifteen minute talk sponsored by the Association on Saturday morning from 9:45 to 10 o'clock over Station WBBM.

The subject for the week is as follows:

January 7. Heart Disease in Children.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

County Society Occupies New Quarters.—The Los Angeles County Medical Association opened new headquarters at 1925 Wilshire Boulevard, Los Angeles, with its annual meeting, December 15. The new home of the society is a renovated building, which is expected to fill its needs until a permanent home is erected. Adequate office space and rooms for various society activities are provided.

Society News.—Dr. Frank H. Lahey, Boston, addressed the Los Angeles County Medical Association, December 7, on "Management of Thyroid Conditions."——Dr. Samuel Ayres, Jr., addressed the Pacific Physical Therapy Association in Los Angeles, November 30, on "Electrosurgical Methods in Dermatology."——The San Diego Academy of Medicine was addressed, December 6, by Dr. Frank H. Lahey, Boston, on "Diseases of the Biliary Tract," and December 8-9, Dr. Everett D. Plass, Iowa City, on "Toxemias of Pregnancy."——A symposium on peptic ulcer was conducted before the Alameda County Medical Association, December 19, by Drs. Fletcher B. Taylor, Carl B. Bowen, Arthur M. Smith and Sumner Everingham, Oakland.——Dr. Russell M. Wilder, Rochester, Minn., addressed a joint meeting of the San Diego County Medical Society and the staff of the naval hospital, December 7, on "Diagnosis of Parathyroid Overfunction."——After consideration of the report of the Committee on the Costs of Medical Care, the Orange County Medical Society recently adopted unanimously a resolution approving a careful study through its committee on economics of any arrangement that may be submitted to equalize the cost of medical care in its community. The resolution also pointed out that no member of the association should enter into a contract or agreement with any individual or organization wherein medical services are involved without first receiving the sanction of the committee on economics and the association as a whole.——Dr. Paul B. Magnuson, Chicago, addressed the Los Angeles Surgical Society, December 29, on backache.

GEORGIA

Vaccine Made with New Strain of Typhoid Bacillus.—The laboratory of the state department of health announces that a new strain of typhoid bacillus has been selected in the preparation of typhoid vaccine. Physicians and health officers having old stocks of vaccine, ordered prior to November 1, are requested to return it to the laboratory and order a new supply. According to *Georgia's Health*, this change is the result of experiments in England and America which tend to show that the old Rawlings strain of typhoid bacillus, during the many years of use, may have lost some of its potency.

ILLINOIS

Radio Talks on Mental Health.—A series of radio talks over Station WGN, Chicago, sponsored by the Illinois Society for Mental Hygiene, will be given on Thursdays at 11:59 a. m., beginning January 12. Following is the list of speakers and their subjects:

January 12, Miss Helen L. Myrick, executive secretary of the society, Your Mental Health.
January 19, Dr. Theodore Wheeler, consulting psychiatrist, Central Free Dispensary, Chicago, Standing Up to Your Problems.
January 26, Dr. Wheeler, Through Thick and Thin.
February 2, Miss Agnes A. Sharp, analytical psychologist, Central Free Dispensary, Something to Do.
February 9, Dr. Charles F. Read, managing officer, Elgin State Hospital, Forgetting Your Troubles.
February 16, Miss Myrick, Keeping Down to the Joneses.
February 23, Miss Sharp, What Is Your "Line"?
March 2, Dr. Douglas G. Campbell, psychiatrist, student health service, University of Chicago, Helping the Other Fellow.
March 9, Dr. Campbell, Keeping Fit.
March 16, Dr. Read, Life's Darkest Moment.
March 23, Miss Myrick, The Silver Lining.
March 30, Dr. Read, Controlling Your Destiny.

Chicago

Society News.—Officers of the Institute of Medicine of Chicago, recently elected for the ensuing year, include Drs. Ludvig Hektoen, chairman of the board of governors; Isaac A. Abt, president; Basil C. H. Harvey, vice president; George H. Coleman, secretary, and John Favill, treasurer.

Personal.—Dr. Frank J. Jirka has been appointed medical superintendent of the House of Correction, succeeding Dr. Charles E. Sceleth, who retired after thirty-three years' service.——Dr. Richard M. Davison was recently appointed assistant in surgery at the University of Illinois College of Medicine.

Public Lectures on the Handicapped Child.—The crippled child, behavior problems of children, the delinquent and the dependent child will be discussed in a public meeting, January 11, sponsored by the Chicago Medical Society. Speakers will be Anne S. Davis, director, vocational and educational guidance bureau, board of education of Chicago; Dr. Paul L. Schroeder, director of the Institute for Juvenile Research; Dr. James P. Molloy, Jr., clinical director of the institute, and Judge Mary Bartelme of the juvenile court of Cook County.

INDIANA

Society News.—Speakers before the Indianapolis Medical Society, December 20, were Drs. Arthur F. Weyerbacher and William E. Tinney on "Urinary Antiseptics" and "Urinary Calculi," respectively.——At a meeting of the Ripley County Medical Society in Osgood, November 9, Dr. George A. Hendon, Louisville, spoke on venoclysis.——Dr. Hobart C. Ruddick, Evansville, addressed the Gibson County Medical Society in Princeton, December 12, on hand infection.——The Carroll County Medical Society, Delphi, heard Dr. Charles R. Sowder, Indianapolis, discuss diseases of the respiratory tract, December 9.——Dr. Robert J. Masters, Indianapolis, was elected president of the Indiana Academy of Ophthalmology and Otolaryngology, December 14, and Dr. John K. Leasure, Indianapolis, reelected secretary. Indianapolis was chosen for the next annual meeting, Dec. 13, 1933.——Dr. Neslen K. Forster, Hammond, addressed the Porter County Medical Association in Valparaiso, November 29, on "Differential Diagnosis of Pelvic and Urinary Diseases in the Female."

Twenty-Fifth Anniversary of State Journal.—The December issue of the *Journal of the Indiana State Medical Association* observes the twenty-fifth year of its establishment with a special anniversary number. Nine pages are devoted to memorial tributes from medical and other friends of the late Dr. Albert Eugene Bulson, editor of the journal from its inception until his death in July. In this issue, for the first time in the journal's history, a picture of Dr. Bulson appears in its pages. The journal also includes a chronology of the state association since Oct. 15, 1907, by Dr. Joseph H. Weinstein, Terre Haute; history of the journal by Dr. William N.

Wishard, Indianapolis; "History of Medical Education in Indiana in the Last Twenty-Five Years," by Dr. Burton D. Myers, Bloomington, and an account of the state board of health by Dr. William F. King, Indianapolis. It also contains articles by Dr. Bulson on "The Eye Fundus Lesions in Nephritis"; Dr. William F. Clevenger, Indianapolis, "Pathologic Mastoid," and Leonard A. Ensminger, Indianapolis, on "Physiotherapy."

LOUISIANA

Good Health Week.—The Orleans Parish Medical Society, in the interests of better health, conducted an educational campaign for one week beginning December 12. Among features of the campaign, known as "Longer Life Week," were daily addresses given by members of the society.

Dr. Bloodgood Gives Memorial Oration.—The Seventh Stanford E. Chaille Memorial Oration of the Orleans Parish Medical Society was delivered, December 19, at the Hutchinson Memorial, New Orleans, by Dr. Joseph C. Bloodgood, Baltimore, on "What Every Doctor Should Know About Cancer."

Society News.—At a meeting of the Orleans Parish Medical Society, December 12, speakers were Drs. Edward L. King, on "Use of Thymophysin and Similar Preparations in Obstetrics"; Albert E. Fossier, "Cardiorenal Death Rate of New Orleans," and Jackson Thornwell Witherspoon, "Treatment of Menstrual Disorders by the Injection of Blood from Pregnant Donors."——The Fifth District Medical Society was addressed in Monroe, December 15, among others, by Drs. John H. Musser, New Orleans, on "Syphilitic Heart Disease" and Joseph Hume, New Orleans, "Prostatic Resection."

MAINE

Society News.—Speakers at the annual meeting of the Penobscot County Medical Society, November 14-15, included Drs. George Blumer and Samuel C. Harvey, New Haven, Conn., on "Granulopenia and Agranulosis" and "Process of Repair and Its Practical Significance," respectively.——Dr. Oscar R. Johnson addressed the Portland Medical Club, November 1, on syphilis.

Graduate Teaching Clinic.—Dr. Henry A. Christian, Hersey professor of the theory and practice of physic, Harvard University Medical School, Boston, conducted the third graduate teaching clinic at the Central Maine General Hospital, Lewiston, November 21-22. Ward walks and a round table conference formed the program the first day, with an address in the evening by Dr. Christian on "Cardiac Disease and Its Treatment." Cases were presented with discussions the second day.

MARYLAND

Society News.—A symposium on arthritis constituted the program of the Baltimore City Medical Society, December 16; the speakers were Drs. Allen F. Voshell, George E. Bennett, Sydney R. Miller and Leonard G. Rowntree, Philadelphia.

Leeuwenhoek Tercentenary Observed.—The Johns Hopkins University Institute of the History of Medicine commemorated the three hundredth anniversary of the birth of Antonj Van Leeuwenhoek, 1632-1723, with a program, December 20. Dr. William H. Welch, formerly director of the institute, gave an illustrated lecture on Leeuwenhoek and his work. A film, made especially in Holland to commemorate the tercentenary, was shown. There was also an exhibit of illustrative books, documents and instruments.

MASSACHUSETTS

Child Guidance Clinic.—A new child guidance clinic, including a nursery for psychologic study of infants, has been established at the Boston Psychopathic Hospital under the direction of Dr. Oscar J. Raeder.

Discussions on Cancer.—The Massachusetts Department of Public Health is conducting state wide meetings to discuss cancer prevention and cure. In Worcester, December 7, lectures were given at Memorial Hospital by Drs. Henry K. Pancoast, professor of roentgenology, University of Pennsylvania School of Medicine, Philadelphia, and Frank E. Adair, attending surgeon, Memorial Hospital, New York. Methods of furthering cancer education were discussed by lay cancer education committees meeting simultaneously at the Hotel Bancroft.

Sesquicentenary of Professorship at Harvard.—The one hundred and fiftieth anniversary of the establishment of the professorship of theory and practice of physic at Harvard University Medical School, Boston, was observed, December 20. Since the founding of the professorship, Dec. 24, 1782, the chair has had only seven occupants:

Benjamin Waterhouse, 1782-1812.
James Jackson, 1812-1836.
John Ware, 1836-1859.
George Shattuck, 1859-1874.
Francis Minot, 1874-1891.
R. H. Fitz, 1892-1908.
Henry A. Christian, 1908.

All these physicians preceding Dr. Christian were represented at the ceremony by descendants, five of whom are now members of the teaching staff of the school. The following program was presented:

Benjamin Waterhouse and the Introduction of Vaccination into America, by his great-great-granddaughter, Margaret Thayer Lancaster.
James Jackson as Professor of Medicine, by his great-grandson, Dr. George R. Minot, professor of medicine.
John Ware, the Family Physician, by his grandson, Dr. Robert M. Green, assistant professor of applied anatomy.
George Cheyne Shattuck and His Medical Contributions, by his grandson, Dr. George Cheever Shattuck, assistant professor of tropical medicine.
Francis Minot and Hemorrhage in the New-Born, by his grandson, Dr. Francis Minot Rackemann, instructor in medicine.
Reginald Heber Fitz and Appendicitis, by his son, Dr. Reginald Fitz, associate professor of medicine.

Dr. Christian, the present Hersey professor of the theory and practice of physic, was also on the program. During the celebration Mrs. William Roscoe Thayer, great-granddaughter of Benjamin Waterhouse, presented to the medical school a snuff box and a silver case containing two lancets which were presented to Dr. Waterhouse by Jenner in appreciation of the work that he did in introducing Jenner's great discovery into America.

MINNESOTA

Dr. Rankin to Resume Private Practice.—Dr. Fred W. Rankin, Rochester, who has announced his retirement from the Mayo Clinic, effective January 1, will resume private practice in Lexington, Ky., where, several years ago, he practiced surgery. Dr. Rankin has been surgeon to the Mayo Clinic since 1926, and is also associate professor of surgery in the University of Minnesota Medical School.

County Societies Merge.—The Houston-Fillmore Counties Medical Society and the Olmsted County Medical Society combined at a meeting, November 30. The new organization will be known as the Olmsted-Houston-Fillmore Counties Medical Society. Dr. George B. Eusterman, Rochester, was elected president; Dr. Norman E. Anderson, Harmony, vice president, and Dr. Monte C. Piper, Rochester, secretary. Meetings will be held on the first Wednesday of alternate months.

Discussion of Committee Report.—A conference, sponsored by the Hennepin and Ramsey county medical societies, was called by the Minnesota State Medical Association, December 18, to discuss contract practice as proposed in the majority report of the Committee on the Costs of Medical Care. The program was as follows:

Cost of Medical Care (Why a Survey Was Made; Results Expected), Francis S. Chapin, Ph.D., chairman, department of sociology, University of Minnesota.
Majority and Minority Reports, C. E. Rudolph, D.D.S., Minneapolis, member of the committee.
What It Means to Organized Medicine, Dr. Olin West, Secretary, American Medical Association, Chicago.
What Organized Medicine Believes, Dr. Edward H. Cary, Dallas, Texas, President, American Medical Association.
What Can Be Done, Dr. Charles B. Wright, Minneapolis, chairman, Committee on Legislative Activities, American Medical Association.
Some Principles, Dr. Melvin S. Henderson, Rochester, president, Minnesota State Medical Association.
Our Plans for 1933, Dr. Naboth O. Pearce, Minneapolis, president-elect, Minnesota State Medical Association.
What Is the Relation of the Medical School Hospital to the Practice of Medicine? Richard E. Scammon, Ph.D., dean, medical science, University of Minnesota.
The Health Officer and Preventive Medicine, Dr. Francis E. Harrington, health officer of Minneapolis.
The Doctor and Preventive Medicine, Dr. John A. Thabes, Brainerd, president of the state board of health.
Group Hospitalization Plans, Mr. A. M. Calvin, executive manager, Mounds Park and Midway Hospital, St. Paul.
What Your Committees Are Doing in Regard to These Problems, Drs. Herman M. Johnson, Dawson, Lyman R. Critchfield, George A. Earl, St. Paul, and Theodore H. Sweetser, Minneapolis.

Society News.—At the twelfth meeting of the Minnesota Radiological Society in Duluth, October 8, Drs. John R. McNutt, Duluth, spoke on "Roentgen Findings in Pneumoconiosis"; Frederick B. Exner, Minneapolis, "Roentgen Therapy in Carcinoma of the Uterine Corpus"; Murdoch A. Nicholson, Duluth, "Roentgen Visualization of the Urethra, Normal and Pathological"; Frank J. Hirschboeck, Duluth, "Atelectasis of the Lungs." A round table discussion on problems of roentgen diagnosis and therapy was conducted by Drs. Gage Clement, Duluth, and Byrl R. Kirklin and Stuart W. Harrington, Rochester. The next meeting of the society will be in Minneapolis in February.——Dr. Arnold Schwyzer,

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St. Paul, spoke on "Thrombophlebitic Sepsis" before the Minnesota Academy of Medicine, December 14; Dr. Frederick H. K. Schaaf, Minneapolis, presented a thesis on "Recurrent Gout," and Dr. Martin Nordland, Minneapolis, a case report on mesenteric cyst.——Dr. Albert E. Russell, Washington, D. C., will address the Hennepin County Medical Society, Minneapolis, January 9, on "Silicosis and Associated Respiratory Diseases."——Dr. William C. White, Washington, D. C., addressed the students and faculty members of the University of Minnesota School of Medicine, Minneapolis, December 2, on tuberculosis.——Dr. Charles H. Mayo, Rochester, was elected president of the Minnesota Public Health Association at its annual meeting in St. Paul, November 18.

NEBRASKA

District Society Meetings.—Meetings for the fifth councilor district were held in Columbus, November 15, and in Fremont, November 16. At Columbus, Dr. Adolph Sachs, Omaha, presented a clinical demonstration of cases of heart diseases and Dr. James E. M. Thomson, Lincoln, spoke on the care of common fractures. At Fremont, Drs. Fred W. Rankin, Rochester, Minn., and Aldis A. Johnson, Council Bluffs, Iowa, spoke on "Carcinoma of the Rectum and Rectosigmoid" and "Common Errors in Diagnosis and Possible Ways of Avoiding Them," respectively.——The fall meeting of the third councilor district was held in Tecumseh, November 10. Among other speakers were Drs. Earl B. Brooks, Lincoln, on "Eye Complications in Sinus Disease"; John R. Moritz, Beatrice, "The Status of Surgery in Relation to Vasomotor Changes," and Raymond L. Traynor, Omaha, "Hypertension." Dr. Karl S. J. Hohlen, Lincoln, presented a film on "Encephalography as an Aid to Diagnosis."

NEW JERSEY

Society News.—Dr. Gordon M. Bruce, New York, addressed the Academy of Medicine of Northern New Jersey, November 17, on "Eye Symptoms as Signs of Vascular Disease."——Dr. Meredith F. Campbell, New York, addressed the Morris County Medical Society, November 17, at the New Jersey State Hospital, Greystone Park, on "Persistent Pyuria in Infants and Children."——Drs. Irving H. Pardee, New York, and Abraham Shulman, Paterson, addressed the Passaic County Medical Society, Passaic, November 10, on endocrinology and leukorrhea, respectively.——Dr. Horace D. Bellis, Trenton, was elected president of the Society of Surgeons of New Jersey at the annual meeting in Elizabeth, December 14. Dr. Samuel A. Cosgrove, Jersey City, was reelected secretary.

NEW YORK

Society News.—Drs. Edward N. Packard and Edward S. Welles, Saranac Lake, addressed the Medical Society of the County of Jefferson, November 10, on surgical treatment of tuberculosis.——Drs. Ralph Pemberton, Philadelphia, and Charles Gordon Heyd, New York, addressed the Medical Society of the County of Rensselaer, December 14, on arthritis and surgical consideration of jaundice, respectively.

New York City

In Memory of Professor Lusk.—A memorial meeting in honor of Graham Lusk, Ph.D., late professor of physiology, Cornell University Medical College, was held at the New York Academy of Medicine, December 10, under the auspices of the Harvey Society. Addresses were delivered by Drs. John A. Hartwell and Homer F. Swift, New York; Anton J. Carlson, Chicago; William S. McCann, Rochester; Elliott P. Joslin, Boston, and Russell H. Chittenden, Sc.D., New Haven, Conn.

Discussion of Current Medical Problems.—Dr. Morris Fishbein, Chicago, editor of THE JOURNAL, will deliver an address on "The Trend of Private Practice" and Dr. Haven Emerson, on "Facts and Opinions from the Committee on Costs of Medical Care" at Mount Sinai Hospital, January 7. Dr. Sigismund S. Goldwater, chairman of the council on community hospital relations, American Hospital Association, and Dr. Bernard Sachs, president-elect, New York Academy of Medicine, will discuss the addresses.

German Medals Awarded to American Scientists.—The gold medal of the Paul Ehrlich Foundation of Germany has been awarded to Dr. Oswald T. Avery of the Hospital of the Rockefeller Institute for Medical Research, and the silver medal to Michael Heidelberger, Ph.D., formerly of the hospital staff, for their chemo-immunologic discoveries. Dr. Heidelberger is now associate professor of biochemistry at the College of Physicians and Surgeons, Columbia University. Dr. Avery received last April the first John Phillips Memorial Prize of the American College of Physicians in recognition of his discovery of a bacterial enzyme capable of decapsulating type 3 pneumococci.

Private Practitioners to Examine Food Handlers.—After January 1, medical examinations of the 325,000 food handlers in New York will be made by private physicians instead of by the department of health as heretofore. The conviction that the state should not compete with private physicians in the practice of medicine, together with the precarious economic position now occupied by a large number of private physicians, was given as the explanation for the reorganization of the work. Under the new procedure the applicant will be examined by his own physician, who must fill in the application, giving a complete history of the person's health as regards tuberculosis, venereal diseases, typhoid and skin diseases. The application is forwarded to the division of food handlers, where it is rechecked. The food handler's certificate for the current year, bearing the seal of the health department, is then sent to the physician, who gives it to the applicant. If any evidence of communicable disease is disclosed by the physician's examination, the person shall be instructed to visit the health department's clinic at 128 Prince Street, Manhattan. Special clinics for routine examinations were to have been discontinued about December 1, according to the bulletin of the health department, December 3.

PENNSYLVANIA

Society Endorses Minority Report.—The Lackawanna County Medical Society at a meeting in Scranton, December 13, unanimously adopted a resolution endorsing the minority report of the Committee on the Costs of Medical Care. The resolution said in part:

> In considering the findings of this committee, we would emphasize to our membership and we would direct the attention of the public to the dominating fact that the great concern of the medical profession and the conservation of the interests of the public is in the preservation of the status of the general practitioner—the family physician—as the unit and the central figure in dealing with all the varied suffering classified under the head of human sickness . . .
>
> The conviction born of the experience of ages is unalterable that the practice of medicine is solely for those who know it best; that at this stage in human progress, there is no place for the covetousness of Sovietism in the practice of medicine; nor in the paternalistic adaptation of human ills and suffering to the devastating evils of mass production; nor the usurpation of the rights of the general practitioner—the family physician—by any system, the outgrowth of Socialistic tendencies, utopian fantasies or the invading, exploiting spirit of governmental agencies, public health foundations and kindred Sovietizing groups.

The resolution commended the report of the Commission on Medical Education, which deprecated efforts to provide standardized medical service on a mass production basis. In addition, a special committee headed by Dr. Martin T. O'Malley was appointed for the dissemination of medical data to the public.

Philadelphia

Symposium on Lead Poisoning.—Five Baltimore physicians presented addresses on lead poisoning at a meeting of the Philadelphia Pediatric Society, December 13, as follows: Drs. Huntington Williams, "An Outbreak of Lead Poisoning in Baltimore from an Unusual Source"; Thomas Campbell Goodwin, "Clinical Manifestations of Lead Poisoning in Children"; Edwards A. Park, "Changes Produced by Lead in Bones of Children"; Paul G. Shipley, "Detection of Lead in the Blood by Means of the Spectograph," and David H. Shelling, "An Experimental Basis for Treatment of Lead Poisoning."

University News.—Dr. Ernst Waldschmidt-Leitz, director of the Institute of Biochemistry of the Technical High School in Prague, and three research assistants, Drs. Arnulf Purr, Franz Koehler and Leopold Weil, have recently come to the Graduate School of Medicine, University of Pennsylvania, to spend a year in the study of the relation of enzymes to cancer research, *Science* reports. Dr. Anton Schaffner will join the group in February, it was announced. Dr. Waldschmidt-Leitz will bring from Prague virtually all the technical apparatus for his work.——Sir James Colquhoun Irvine, Ph.D., vice chancellor and principal, University of St. Andrews, Aberdeen, Scotland, gave a lecture at the University of Pennsylvania, October 31, on "The Chemistry of Starch."

RHODE ISLAND

Society News.—Drs. Dennett L. Richardson and Harold E. Smiley addressed the Providence Medical Association, December 5, on "The Hemolytic Streptococcus" and Dr. Anthony V. Migliaccio, on "Avertin Anesthesia in General Surgery."

Society Honors Dr. Leonard.—The Providence Medical Association at its meeting, December 5, paid tribute to Dr. Charles Henry Leonard, dean of the Providence medical

profession, in honor of his ninety-first birthday, which occurred December 29. Dr. Lucius E. Kingman, president of the society, presided during informal ceremonies. Dr. Leonard, a native of Indiana, has lived in Providence since shortly after his graduation from the College of Physicians and Surgeons of Columbia University, New York, in 1868 and has been in charge of vaccination for the city health department since 1870.

WASHINGTON

Meeting of County Officers.—A meeting of officers of county medical societies, the first of its kind in the state, was held in Seattle, December 15. Dr. Alexander H. Peacock, president-elect of the Washington State Medical Association, reported the recent conference of state secretaries and editors in Chicago; Mr. Speed Smith discussed legal medicine; Dr. Frederick A. Slyfield, certification of specialists; Dr. Warren B. Penney, Tacoma, organized medical bureaus and contracts, and Dr. Harrison Garner Wright, finances of county societies.

Society News.—Drs. George C. Miller, Seattle, and Laurence Selling, Portland, Ore., addressed the Walla Walla Valley Medical Society, December 8, in Walla Walla, on "Diagnosis of Vascular Lesions of the Extremities" and "Recognition of Common Brain Lesions," respectively.——Dr. Adalbert G. Bettman, Portland, Ore., addressed the Cowlitz County Medical Society, November 15, on acid treatment of burns.——Drs. Edwin J. Barnett and Joseph W. Lynch, Spokane, addressed the Yakima County Medical Society, Yakima, November 14, on child psychology and injuries to the brain, respectively.——A symposium on tuberculosis was presented before the Snohomish County Medical Society, Everett, in November, by Drs. Charles F. Eikenbary, Ole A. Nelson, Henry Odland and Philipp Schonwald, all of Seattle.

WYOMING

Personal.—Dr. John R. Nagle, Worland, was elected president of the Northwestern Wyoming Medical Society at the recent annual meeting in Worland. Dr. Frank A. Mills, Powell, was made vice president and Dr. Paul S. Read, Worland, secretary.

GENERAL

Public Health Service Investigates Psittacosis.—In cooperation with state and city authorities in California, the U. S. Public Health Service is conducting an investigation of psittacosis, with Senior Surg. Hermon E. Hasseltine and Passed Asst. Surg. Vane M. Hoge in charge. A laboratory at one of the quarantine stations, probably San Francisco or San Diego, will be utilized in addition to facilities offered by local authorities.

News of Epidemics.—Schools were closed because of scarlet fever during the latter part of November and the first two weeks of December in Marengo, Kansas and a rural district near Gagetown, Ohio. A mild epidemic has persisted since October 15 in Darke County, according to newspaper reports. Five rural schools in Oceana County, Mich., were closed, December 14; fifty cases with one death were reported. A considerable increase over last year is reported in Philadelphia.

Agree to Discontinue Misleading Advertising.—Nine stipulation agreements out of fifteen made public, December 7, by the Federal Trade Commission relate to false advertising in connection with alleged cures for various diseases. In each instance, the advertiser or the publisher in whose periodical was printed the misleading advertisement signed the agreement to discontinue the misrepresentation charged. Three of the stipulations have to do with beauty products such as hair remover, hair dye, perfume and cosmetics. Others pertained to alleged cures of hernia, hemorrhoids, prostatic disease, rheumatism, gout, lumbago, neuritis, neuralgia, sciatica, stomach ulcers, gastritis, acidosis, indigestion, constipation, bladder trouble, backache and muscular aches.

Medical Bills in Congress.—President Hoover in his budget message to Congress, December 7, proposed that the World War Veterans' Act be amended so that, with certain exceptions, veterans of the World War will not be entitled to hospitalization under the act for nonservice disabilities if their incomes are $1,500 or over, if single, and $3,500 or over, if married. *Changes in Status:* S. J. Res. 195 has passed the Senate, granting permission to Drs. Hugh S. Cumming, surgeon general of the United States Public Health Service, John D. Long, medical director of the Public Health Service, and Clifford R. Eskey, surgeon, Public Health Service, to accept and wear certain decorations bestowed on them by the governments of Ecuador, Chile and Cuba "in recognition of assistance rendered by them as representatives of the Pan American Sanitary Bureau in matters relating to sanitation and health." S. J. Res. 217 has passed the Senate, authorizing the President to invite the International Congress of Military Medicine and Pharmacy to hold its eighth congress in the United States in 1935. S. 572, providing that the United States shall cooperate with the states in promoting the welfare and hygiene of mothers and infants, was reached on the Senate calendar, December 8, but consideration of the bill was prevented by Senator King, Utah. H. Res. 312 has passed the House, extending until Jan. 25, 1933, the date on which the Shannon committee, investigating government competition with private enterprises, is to report to the House. *Bills Introduced:* S. 5149, introduced by Senator Wagner (for Senator Copeland), New York, proposes to prohibit the "counterfeiting of drugs." It provides that it shall be unlawful for any person to ship in interstate or foreign commerce, or to sell within any territory of the United States, (1) any false, forged or counterfeit label intended for use in connection with any drug, (2) any drug to the container or wrapping of which there shall be affixed, by any means or in any manner whatsoever, any such label, or (3) any die, plate, brand, engraving or other article intended for use in the making of any such label. The bill further proposes to make it unlawful for any person to deliver to any other person, in the original unbroken package, any such label, drug, etc., after having received the same in any state or territory of the United States from any other state or territory of the United States or from any foreign country. The term "drug" is defined to include all medicines and preparations recognized in the United States Pharmacopeia or National Formulary for internal or external use and any substance or mixture of substances intended to be used for the cure, mitigation or prevention of diseases of either man or animal. H. R. 13356, introduced by Representative Clancy, Michigan, proposes that members of the Naval Reserve and the Marine Corps Reserve who are physically injured in line of duty while performing "authorized drills, equivalent instruction or duty, or appropriate duties, or other duty authorized by regularly constituted authority," or who die as a result of such physical injury, shall be deemed to have received such injury while performing authorized training duty.

CORRECTIONS

Annual Midwinter Course in Ophthalmology and Otolaryngology.—The Research Study Club of Los Angeles will conduct its second midwinter clinical course in otolaryngology and ophthalmology, January 16-28, inclusive. THE JOURNAL, December 17, p. 2119, incorrectly announced the dates for this course as January 16-17.

Report of Food and Drug Administration.—In the news item entitled "Annual Report of Food and Drug Administration" (THE JOURNAL, December 3, p. 1962) the word "seized" in the second line should have been "collected." The Department of Agriculture collected 38,815 samples of foods and drugs during the year, but the total number of prosecutions and seizures instituted was only 2,567. In the entire twenty-six years of the history of the Food and Drugs Act there have been instituted only 19,400 legal actions involving both seizures and prosecutions.

Government Services

Change of Station in Navy

Lieut. Comdr. Harold E. Ragle, from navy hospital, Mare Island, Calif., to air base, Pearl Harbor, T. H.

Comdr. Clyde B. Camerer, from the naval hospital, San Diego, to the U. S. S. *Tennessee*.

Lieut. Comdr. Richard W. Hughes, from the naval hospital, League Island, Philadelphia, to the naval hospital, Washington, D. C.

Lieut. Carey M. Smith, from the U. S. S. *Tennessee* to the naval dispensary, San Pedro, Calif.

Lieut. Emory E. Walter, from the naval academy, Annapolis, Md., to instructor, naval medical school, Washington, D. C.

Lieut. Benjamin N. Abl, from the U. S. S. *Arkansas* to the naval hospital, Mare Island, Calif.

Lieut. Cameron L. Hogan, transferred from submarine base, Coco Solo, Canal Zone, to navy hospital, New York.

U. S. Public Health Service

Sr. Surg. Lawrence Kolb, assigned as chief medical officer of the Hospital for Defective Delinquents, Springfield, Mo.

Acting Asst. Surg. Charles E. Athey, relieved at Progreso, Mexico, and assigned at the quarantine station, New Orleans.

Asst. Surg. Benton O. Lewis, relieved at Washington, D. C., and assigned at the Marine hospital, New Orleans.

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Foreign Letters

LONDON

(From Our Regular Correspondent)

Dec. 3, 1932.

Views on Medical Education

In previous letters the need for reform of the medical curriculum was stated and the views of leading teachers were given. It is of interest to compare them with the conclusions of equally competent men who look at the subject from a different angle. The General Medical Council, which supervises medical education and examinations for diplomas, has just published the reports of its inspectors. Dr. Wardrop Griffith, professor of medicine in the University of Leeds, the medical examiner, says: "The subject of medicine is now a very large one and its scope tends year by year to increase. It is true, as we all trust, that the facilities to the students also increase and that many a man who is honestly distressed by the thought of how much a student in these days has to master would be comforted if he understood better the relation between examination and instruction that now exists." Mr. Farquhar Macrae, lecturer on clinical surgery in the University of Glasgow, inspector in surgery, says: "Though one hears a great deal about the medical students' course being too exacting, the impression I gained was not in support of this view. On the contrary, I found invariably that, where the demand by the teachers and local examiners was for high standard of knowledge, that standard was attained by the average student; while, where the converse was the case, the amount of knowledge possessed by the average student was comparatively low." Dr. J. S. Fairbairn, lecturer on midwifery and Diseases of Women at St. Thomas's Hospital Medical School, inspector in examination in these subjects, says of the clinical examination in midwifery: "I have been greatly impressed by the great progress that has been made by the universal adoption and the general satisfactory character of this portion of the examination."

At the meeting of the council, which considered the report of the examination committee, it was recommended that there should always be a test of a candidate's knowledge, both written and clinical, in diseases of children. Sir George Newman, chief medical officer of the Ministry of Health, delivered an important criticism. Dealing with his own subject, he agreed that preventive medicine should not be described as a subject but rather as an aspect of all other subjects. There was still a somewhat profound misunderstanding as to what preventive medicine really was. Every subject had a valuable preventive aspect if it was rightly presented, and unless the council was careful it was in danger of missing the tide in regard to this aspect of medicine. Dealing with clinical teaching, he said that it was not taking reasonably full advantage of the advances that had been made in physiology and pathology; he was prepared almost to include anatomy also. Clinical teaching was too many years behind the applications of physiology and pathology. He recognized that there were many difficulties in the way of the busy consultant being able, with his many preoccupations, to make use of the knowledge now available. He believed that the clinical teacher, as a rule, treated anatomy too much as a dead subject. He feared that medicine was being split up into too many specialisms. In the last hundred years English medicine had always stood for the unity of medicine, and in our time we must see that it was not conveyed to the student's mind that many of these things are entities *ad hoc* apart from the general body of medicine. No doubt there is much in Sir George Newman's criticisms, but with regard to one of them it must be remembered that he is not a clinician and therefore may have an exaggerated view of the practical value of "advances" in pathology and physiology. Clinicians know only too well that their application to practice is often difficult and disappointing. Sir George also seems to have forgotten that since the introduction of the "unit" system into our hospitals much of the teaching is done by a whole time professor and his assistants, who are not "preoccupied" with consultant work. But it is the practical nature of the English mind, with its distrust of the theoretical, which largely accounts for his criticism. Though this mind may have "the defects of its qualities," it has accomplished in medicine, as well as in other spheres, great things.

Loss of Life by Fire

About 1,470 lives were lost by fire in England and Wales last year, the highest losses occurring between the ages of 1 and 5 years. The cause of most fires was carelessness and a frequent cause was the use of gasoline in cleaning, on which the government has issued a warning, supplementing that given in 1928. In one case a woman, recognizing the danger, carried her cleaning into the garden. Fumes made her faint, and in falling she upset the basin of gasoline over herself. Her daughter carried her into the house. As she passed through the kitchen, where a gas stove was burning, gasoline from her soaked clothing was ignited and both persons were burned to death. In another case gasoline vapor travelled from one room to another, where there was an open flame, and then flashed back again, killing a woman where the cleaning was being done.

BERLIN

(From Our Regular Correspondent)

Nov. 21, 1932.

Restriction of Dangerous Methods for Interrupting Pregnancy

In recent months, a topic much discussed in a certain type of propaganda has been the so-called nonoperative interruption of pregnancy by the injection of pastes into the uterus. Contrary to the widely advertised statements about the simplicity and reliability of the method and concerning the complete harmlessness of the application, a number of deaths have been reported in the literature, concerning which Dr. F. Engelmann, director of the Städtische Frauenklinik in Dortmund, wrote a comprehensive article for the *Deutsche medizinische Wochenschrift* (**58**:166 [Jan. 29] 1932).

On the basis of all these observations, the Berlin Medizinische Gesellschaft filed a petition with the proper authorities, demanding that the sale of these remedies be confined by law to licensed pharmacists. Gynecologists have urgently warned against the careless use of these remedies; others have not taken such a severe attitude, and some have even highly recommended the method. The composition of these remedies is known in part. For example, the "Interruptin" Paste, according to the proponent, is said to consist chiefly of such old remedies as rosemary, aloes, myrrh, crocus and camphor. In addition, there are other drugs and ingredients of the posterior lobe of the hypophysis and, likewise, probably iodine. The so-called Interruptin-Neu is an ointment-like substance, it being especially emphasized that it is fat free because of the possibility of producing fat embolism. Another of these preparations is said to have a soap base and to contain iodine, potassium iodide, thymol and astringents. Still another preparation is said to be composed of medicated soap, iodine, potassium iodide, eucalyptus oil, rosemary oil and potassium carbonate. The action is doubtless due to the fact that a portion of the ingredients is carried into the ovisac and thus causes the death of the ovum, and that, on the other hand, the paste exerts a caustic action on the uterine mucosa. The mechanical action of the paste is also to be considered.

These events caused considerable stir among the medical profession, and the medical journals contained for a time many articles dealing with the subject. Now the following official regulation has been enacted:

According to a decree of the federal minister of the interior, which is based on an opinion of the federal bureau of health,

as of Nov. 1, 1932, Heiser's paste, Interruptin (also Interruptin-Neu), Antigravid, Provocol, Aretus, and all other preparations now on the market or that may appear, consisting of pastes or ointments or similar bodies, which are designed to be introduced within the uterus, shall be dispensed only in pharmacies on presentation of a prescription (to be renewed each time) bearing the signature of a physician and supplied with the current date. In addition to the usual regulations concerning the prescribing of medicines that may be dispensed only on presentation of a physician's prescription, the pharmacist must be able to see clearly from the physician's prescription presented that the remedy is intended for the use of the prescribing physician in his regular practice. If there is no definite statement to that effect in the prescription itself, or if the remedy is prescribed for a person who is to be treated, or for any other person, the pharmacist is not given authorization to dispense the remedy.

This regulation followed demands of this nature presented by some eminent gynecologists. If a physician considers it advisable to use the aforementioned preparations, he can, on assuming full responsibility, secure these pastes in the same manner as any other medicaments. Thus, now, these ointment preparations may be procured only in pharmacies and only on presentation of a physician's prescription, and it remains to be seen whether this regulation will actually protect the public health; otherwise, further restrictions, and, if need be, even a federal interdiction of these intra-uterine pastes, may be expected.

The Prussian minister of public welfare, in a corresponding announcement, called especial attention to the warnings and to the dangers to life that may be associated with the use of these pastes and emphasized that they may be used only on the basis of medical indications and only when a physician assumes full responsibility for their use.

Legal Protection for the Term "Health Resort"

The term "health resort" serves no doubt as a stimulus to persons seeking a place to spend a vacation. In Germany an endeavor is being made to give legal protection to legitimate users of this term. By "health resort" is meant a place that is sought out by patients because it possesses natural advantages that serve for the restoration of health. The therapeutic factors of health resorts, whether they are springs or climatic conditions, cannot be referred to as therapeutic factors unless it has been demonstrated scientifically and clinically that they are such. If the air of the place is free from injurious ingredients—that is, if it is pure and pleasing—it does not necessarily, on that account, exert a therapeutic action, and a place that has such a climate is not necessarily a therapeutic center but may be merely a pleasant place for recreation.

A more exact definition of the term "health resort" is important, too, because a bona fide health resort has the right of assessing a special head tax against health seekers. The head tax, however, may be used only to cover expenditures for things that benefit all health seekers equally; for example, for hygienic equipment for the maintenance of paths, roads and grounds, and for general concerts, but not for theatrical plays or concerts for which admittance is charged, nor for advertising expense. Likewise, in places of recreation, a fee to cover general expenses would appear reasonable.

A number of health resorts have the right to prefix the word "baths" before the name of the resort. An endeavor is being made to modify the laws so that this shall be accorded only on the basis of the opinion of a committee of experts. The federal law is desired in order that only places that have a well established right be designated as "health resorts"; also that the names of bona fide health resorts be protected. The law is not sought primarily for economic reasons but in order that health seekers may be protected against exploitation. Such a law would greatly clarify the situation.

Overcrowding in the Medical Profession

Attention has been frequently called to the intolerable overcrowding of the medical profession, and no solution appears to be forthcoming. The league of associations of medical students petitioned recently that, in view of the overcrowding in class rooms and laboratories, the number of medical students be restricted to 1,500 yearly. In response to an inquiry of the league, addressed to the faculties of medicine, the universities of Berlin, Hamburg, Halle, Düsseldorf, Tübingen, Göttingen, Breslau and others stated that they had ample space and facilities to meet the demands of medical students. Leipzig and Munich, however, admitted that they were negotiating with their ministries in regard to the crowded conditions. The league continued to support the view that the number of students entering each year on medical studies should be restricted to 1,500. Weighty protests have, however, been raised against any such restriction.

That a solution for the overcrowding is not simple may be seen from the large number of proposals for improvement. For instance, at the economic session of the Deutsches Studentenwerk, Professor Tillmann of Bonn recommended the following measures: general lowering of the age of retirement, in order that the younger physicians may advance more rapidly; abolition of so-called double services and auxiliary services; restriction in the number of women permitted to study medicine; and early placing of young physicians in their locations, because this becomes increasingly difficult for the older men. Tillmann rejects the idea of restricting the number of medical students to be enrolled, and he does not think that the preliminary examination introduced at some universities is calculated to weed out satisfactorily the unfit or the less fit. It is not clear how the future prospects of students are to be improved. It is generally admitted that, in many cases, young persons enter the universities because they are unable to secure employment and wish to cover up the fact. At the University of Berlin there are more than 1,200 students of medicine who have passed their preliminary examination.

ITALY

(From Our Regular Correspondent)

Oct. 31, 1932.

The Medicosurgical Society of Bologna

At a meeting of the Società medico-chirurgica di Bologna, Drs. Ceredi and Nanni reported on the great frequency of subfebrile temperature in children and in young men and women. Of 566 axillary temperatures taken in persons ranging from 5 to 20 years of age, constituting various groups, they found that 63 per cent of the temperatures ranged above 37 C. (98.6 F.) and 38 per cent above 37.2 C. (98.9 F.). These data confirm those collected by Roger and by Richet. The average temperature of the various groups ranged around 37.1 C. (99.8 F.). The averages considered according to age do not show any significant differences. It was interesting to note the individual fluctuations, which frequently ranged between 36.6 C. (97.8 F.) and 37.7 C. (99.8 F.). There were, however, persons in whom the temperature never exceeded 37.2 C. (98.9 F.). From their research the speakers concluded that it is impossible to establish a definite limit between a normal and a pathologic temperature applicable to all persons. There is, however, a personal limit depending on the constitutional habit of the individual ranging between 36 C. (96.8 F.) and 37.7 C. (99.8 F.); hence the knowledge of the individual temperature may represent a new point of view for studying the constitutional type to which a person belongs.

Alestra reported his results in a series of 100 cases of typhoid-paratyphoid infections treated with the lysed vaccine of Di Cristina and Caronia. The results were regarded as satisfactory, since the mortality and the duration of the disease were reduced. In suitable doses, the vaccine is well tolerated by the patients.

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Girolami reported his research on aromatic substances found in the blood in disorders of the liver. There is found almost constantly an increase of aromatic substances in the blood, especially observable in acute lesions of the degenerative type. These substances are found to be somewhat toxic, not having been subjected to the detoxicating action of the liver.

Dalla Volta spoke on the relations between the volume of the blood and the constitution. In eighty-two healthy persons belonging to one of the two antithetic morphologic ectypes (brachytypes and longitypes), the determination of the circulating mass of the blood showed that the volume of the blood is greater in males than in females. The volume diminishes steadily in both sexes with increasing age. Corresponding to an increase in body weight, the absolute value of the blood mass tends to increase, whereas the proportionate value diminishes.

Girolami reported his researches on the action of pepsin, which he introduced parenterally. He noted the effect of the pepsin on the curve of the hydrochloric acid secretion with the Ewald test meal or with the injection of histamine; the action on the curve of peptic secretion secured by means of the Ewald test meal, and the action on the arterial pressure and on the pulse. In patients with various disorders, without direct involvement of the stomach or of the duodenum, there commonly occurred, owing to the action of the pepsin, a diminution in the quantity of the secretion and a lowering of the hydrochloric acid secretion. In reflex gastropathies there was observed in some patients a diminution of the hydrochloric acid secretion and of the quantity of gastric juice. In case of gastric ulcer, the action of the pepsin was manifested by less elevation of the curve as regards both the free and the combined acidity and with respect to the amount of the secretion. Using injections of histamine, he found that pepsin is not a pharmacodynamic antagonist of histamine and is not capable of inhibiting to any extent its stimulative action on the gastric secretion.

In Commemoration of Forlanini and Koch

In connection with a postgraduate course organized at Milan, ceremonies in commemoration of the discoveries of Robert Koch and Carlo Forlanini, in the field of tuberculosis, were held in the Great Hall of the University of Milan, with addresses by Dr. Tomarkin and Professor Tante, representing the Koch institute in Berlin. The speakers brought out that, whereas Koch accomplished the discovery of the tubercle bacillus, Forlanini, starting from another point of view, discovered artificial pneumothorax. The ceremonies were broadcast to numerous stations of central Europe.

Complications of Influenza

The Accademia medica "Filippo Pacini" of Pistoia devoted a session to the study of the meningo-encephalic complications of influenza.

Silvestrini said that previous epidemics have shown that, during the influenza period, encephalitis may be observed. Influenzal meningo-encephalitis has usually a sudden onset. In the cerebrospinal fluid there is a large number of lymphocytes; the Nonne-Appelt and the Boveri reactions are positive. If the fluid contains blood or is intensely xanthochromic, the prognosis is more grave. In some cases choreic movements appear, which take on the hyperkinetic forms of epidemic encephalitis, or there arise bulbar symptoms, which are the cause of death. For the differential diagnosis, importance attaches to a previous or concomitant influenzal infection of the bronchopulmonary or gastro-intestinal type, and the presence of small foci of pulmonary congestion that are almost never lacking in even mild cases of influenzal infection. In view of the difficulties of differential diagnosis between influenzal and tuberculous meningitis, Professor Volterra recommended a refinement in technic for the determination of the tubercle bacillus in the cerebrospinal fluid. The modification consists in distributing the fluid to be examined into several test tubes, transferring the reticulum that forms beneath into a petri dish, staining simultaneously the various reticula and examining them all under the microscope, one after another.

Bacci raised the question as to whether the bacteria and their toxins cause the localizations in the central and peripheral nuclei of the vagus and of the sympathicus. He said that in all infectious diseases, but especially influenza, typhoid and dengue fever, during the acute period of the disease tachycardia and hypotensions prevail as cardiovascular vegetative symptoms, whereas, in the later course of the disease, just the opposite conditions are observable; namely, bradycardia and a rise of arterial pressure. He said that such phenomena cannot be associated with toxemic substances.

PRAGUE

(From Our Regular Correspondent)

Nov. 24, 1932.

Poliomyelitis in Czechoslovakia

Poliomyelitis has become a serious public health problem in Czechoslovakia. It was not a notifiable disease until 1928, at which time it began to spread in a menacing way. The first epidemic in Czechoslovakia was reported in 1929 in the eastern part of the country simultaneously with epidemics in the neighboring countries of Hungary and Rumania. In 1930 there was a remission but in 1931 there were a considerable number of cases in the western part of the country. One of the last meetings of the Association of Czech Physicians was devoted to the demonstration of patients suffering from the results of poliomyelitis. There is in Czechoslovakia a higher proportion of cases in adults than in the United States or the Scandinavian countries, where the disease has been prevalent for many years. The clinical picture shows also some differences from the well known one in children. The disease usually starts with fever, accompanied by severe pain, especially in the extremities. The symptoms are so atypical that in many cases the condition was diagnosed as infectious polyneuritis before paralysis developed. Another difference is the late symptoms. In children, degenerative signs appear soon after the onset of the paralysis, but this does not hold for adults, whose muscles (in the observed cases) decrease in size and strength but never go on to a true atrophy, as they regularly do in children. Naturally the public became alarmed by the appearance of this disease, because experience in other countries shows that the public health authorities are almost powerless against its spread. Convalescent serum has been put on the market by the state institute of public hygiene and good results are reported from its use as a prophylactic and in a very early stage of the disease, while its therapeutic value in the clinically developed cases seems to be quite small.

Masaryk Saves Ministry of Health

The ministry of public health and physical education has existed since the foundation of the independent state of Czechoslovakia in 1918. The wave of economy resulting from the depression has led to the abolishing of such bodies in some European states. With the change of cabinet that came about lately, two ministries have been abolished. There was also a strong movement to abolish the ministry of health but a minister was reappointed as an independent member of the cabinet on the insistence of the president of the republic, Thomas G. Masaryk. Because of economic difficulties he was convinced that the health of the people was especially menaced and that everything should be done to preserve their vitality through the period of depression.

Internist Honored

The sixtieth birthday of Prof. Josef Pelnář was celebrated recently by the whole medical profession. Professor Pelnář is deemed the leading internist of Czechoslovakia and is considered, with Josef Thomayer and Ladislav Syllaba, the founder of the Czech school of internists. He was born in Bohemia and educated in Prague. Early in his career he became inter-

ested in pathologic anatomy and bacteriology. His second main line of work can be traced to his postgraduate studies in Paris, where he became interested in neurology. After the World War he succeeded Josef Thomayer as the chief of the clinic of the Czech medical faculty in Prague, with which he has been connected ever since. His scientific contributions amount at present to more than 200 papers on all branches of internal medicine. Not long ago he began the publication of a voluminous treatise on internal diseases. The first volume, dealing with infectious diseases, is considered a masterpiece of Czech medical literature. He is the chief editor of the *Časopis lékařů českých* (Journal of Czech Physicians). He has not only brought the journal to a level never attained before, but in this capacity he influences the medical life of Czechoslovakia through short editorials, in which he takes a stand on every phase of medical activity. His prominent position as a clinical teacher has given him membership in many scientific societies in foreign countries.

The Birth Control Discussion

The profession as well as the public is discussing the question of legalization concerning the interruption of pregnancies. The discussion was aroused by a proposed law that was worked out by the ministry of justice. The present law places a severe penalty on the artificial interruption of pregnancy. In spite of the law, abortion has become widespread, especially among the lower classes, abortions being done both by practitioners and by midwives. The proposed law now would legalize artificial interruption of pregnancy in cases having proper medical, social and eugenic indications. The point of dispute is the so-called social indication. According to the proposed law, a woman whose family would endanger its maintenance and nutrition through the birth of another child would be allowed to ask for an interruption of her pregnancy. The law would specify that such interruption of pregnancy be carried out in public institutions or, in case of inadequate accommodations, in private practice with the consent of two physicians. Advocates of the law point out the damage to the health of mothers who have criminal abortions carried out on them by incompetent persons. The opponents of the law emphasize that an interruption of pregnancy is a serious operation which can never be done without serious after-effects. They say also that the legalization of abortion may lead to immortality among young people. The interruption of pregnancies in public institutions is impracticable because the state would never create a sufficient number of beds and the whole practice would remain in the hands of local practitioners. It is pointed out from both sides that the main stimulus to the proposed law is a difference in fertility in the higher and lower classes. As long as this situation continues, the problem of artificial abortion will be pressing. The only remedy lies in the equalization of fertility in different classes of the population. This can be achieved through the spread of contraceptive information also to the lower classes. Catholic circles are absolutely against the project and all the contraceptive propaganda, while Protestant circles are opposing only artificial abortion and are in favor of contraceptive information. It is interesting that the whole proposal came from the initiative of lawyers and judges without the active participation of the medical profession. As the situation stands now it is doubtful whether the law will be passed; but the interest aroused will undoubtedly lead to an active stand being taken on the question of contraception.

Report of Public Health Demonstration

A report of the activities of the public health demonstration in the thirteenth district of Greater Prague has been published. This report closes a five year period of cooperation between local authorities and the Rockefeller Foundation. This experiment was put under way on a cooperative basis by the health department of the city of Prague, the state institute of public hygiene and the ministry of health. The purpose was to organize in Prague a complete public health unit which could be used for the training of public health personnel. The main contribution of the demonstration seems to be that it has worked out a cooperative scheme under which all the local agencies can be united in a single program for the promotion of public health among the population. The organization constitutes a federation of public health and social agencies presided over by the mayor of the district, with the chief health officer as its secretary. The funds of all the agencies are merged and utilized according to a unified program. All the participating institutions have entrusted also the direction of all personnel to the office of the chief health officer. In the course of the demonstration it was necessary to create a number of new public health institutions in order to cope with the public health program of the territory. Especially the child welfare institutions were built up into an elaborate system. In the course of the demonstration not only a notable progress in the health situation was achieved but the demonstration has contributed in a valuable way to the progress of public health research in Czechoslovakia. This was made possible through the cooperation of the state institute of public hygiene, under the auspices of which several cooperative studies have been completed. A special study on the control of milk, another one on the minimal requirements of school medical inspection, and a study on the decline of infant mortality deserve especial mention. It is gratifying to note that in spite of the financial situation of the country it was possible to find local resources to continue the program, which during its development was supported by the contributions of the Rockefeller Foundation.

RIO DE JANEIRO

(From Our Regular Correspondent)

Oct. 15, 1932.

Alcohol Injections in Nerves

Dr. Aresky Amorim of Rio de Janeiro has published an interesting work on alcohol injection in nerves and its therapeutic applications. Luton was the first, in 1863, to employ infiltration of peripheral nerves as a therapeutic measure. The studies of Pitres, in 1887, demonstrated various effects depending on the degree of concentration of the alcohol injected in the nerves: simple irritative neuritis with 50 per cent alcohol, positive physiologic neurotomy with 90 per cent alcohol. The results obtained by Sicard with alcohol injections of the branches of the trigeminal nerve in facial neuralgia are well known. Recently the field of action of alcohol injections has been extended. Maurano of São Paulo has injected alcohol into the phrenic nerve in cases of intractable vomiting. Morelli and Leotta have injected the intercostal nerves to immobilize the thoracic wall in pulmonary tuberculosis. The first three intercostal nerves are completely covered by the ribs. The fourth passes slightly below the fourth rib. The remaining eight nerves are situated at equal distances between two ribs. It is consequently necessary, in order to infiltrate the first nerves, to introduce the needle slantwise above the rib; for the other nerves it is sufficient to inject into the middle of the intercostal space. It is preferable not to inject the first intercostal space on account of the vicinity of the brachial plexus. The author has succeeded in obtaining alcoholization of the intercostal nerves in three patients of the tuberculosis service of Professor MacDowell of the Policlinic of Rio de Janeiro. These were tuberculous patients in whom pneumothorax was impossible on account of pleural adhesions. The alcohol injection was made in two steps, the patient being seated on a chair. The surgeon injected first 2 cc. of a 1 per cent solution of procaine-epinephrine and, after having made sure of the anesthetic effect, he injected 5 cc. of 90 per cent alcohol. The author did not make any injections near the spinal column because he feared radicular disturbances. The operation is painless and the patients complain only of a slight rachialgia for forty-eight hours. The paralysis of the thoracic

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wall and the immobilization of the lung were confirmed by roentgen examination. One of the patients was lost sight of by the author after twenty days. The other two patients, after four months, presented disappearance of cough and expectoration, amelioration of the lesions at roentgen examination, and improvement of the general condition with increase in weight. One of the patients did not have any more bacilli in the sputum. In his case the immobilization of the ribs was incomplete at the end of three months. A new injection of alcohol was found necessary and a phrenicectomy was done at the same time.

The author concludes by discussing the effect that alcoholization of the intercostal nerves might have in case of fracture of the ribs, in which abolition of the movements of the thoracic wall would permit more rapid healing. Another great advantage is the disappearance of pain. Aresky Amorim put his idea into practice with excellent results in a case of fracture of the seventh and eighth ribs, injecting the sixth, seventh, eighth and ninth intercostal nerves.

Alkali Reserve in Normal Persons

Drs. W. Bernardinelli and Gerbert Perissé of Rio de Janeiro decided to study the alkali reserve of normal individuals and especially its variations under the influence of certain factors; sex, profession, race, age, atmospheric conditions, menstruation, and so on. After ninety-nine observations, they concluded that the alkali reserve is higher in men than in women; it is higher in intellectual than in manual workers, in whom there is an acidosis due to the accumulation of lactic acid; atmospheric pressure and temperature have no influence on the alkali reserve within certain limits (754 and 763 mm. of mercury, 24 and 38 C., or 75 and 100 F.). The influence of menstruation is not well established; it seems to diminish the alkali reserve. It is interesting to note that, contrary to the custom of obtaining blood from the patient when fasting and after a night's sleep, the authors collected their material after breakfast and after two or three hours of normal activity of the patient; notwithstanding this, their results agree with those of Lipetz and of Hefter.

Influenzal Meningitis in an Infant

Drs. Rocha Braga and Aristides Marques da Cunha, assistants at the pediatric clinic in Rio de Janeiro, report the case of a child, aged 4 months, breast fed and weighing about 5 Kg. (11 pounds). Two days after the child received a blow on the head as the result of a fall, it had convulsions and fever. At first they thought it was a surgical case. In the meantime the child had a temperature of 39.8 C. (103.6 F.) and presented rigidity of the neck, Kernig's sign, and tache cérébrale. Lumbar puncture gave a small quantity of turbid fluid, containing polymorphonuclear cells and various bacteria. The diagnosis of suppurating meningitis was made without determining the pathologic agent. Two days later the child presented signs of bronchopneumonia. The temperature remained between 39 and 40 C. In various parts of the body appeared abscesses, the drainage of which was necessary. Later there was pleural effusion on both sides. Puncture of the right pleura gave a hemorrhagic fluid. At necropsy was found in the cerebrospinal fluid an intense polynucleosis and a gram-negative bacillus, either free or intracellular. Culture of the fluid on blood agar gave the same bacillus. The same result was obtained from a blood culture with the pleural fluid and the pus from the abscesses. The whole brain was covered by a membranous yellowish green exudate 2 mm. thick, allowing no sight of any part of the nervous tissue, which did not present any microscopic lesions. There was diffuse meningitis but not the slightest focus of encephalitis. This case of suppurative meningitis in a nursling of good previous health, ending fatally, seems to belong to the type of meningitis due to Pfeiffer's bacillus, which preferably attacks infants.

Marriages

RUSSELL E. MILLER, Burlington, Wis., to Miss Imogene Bafford of Indianapolis, at Waukegan, Ill., December 8.

SAMUEL WALDRON LAMBERT, JR., New York, to Miss Maria W. Baldwin Hamill of Princeton, N. J., September 24.

FRANCIS MARION WATSON, Quincy, Fla., to Miss Margaret Tatum at Belmont, N. C., October 25.

FRANK M. KILLIAN to Miss Sallie Taylor, both of Franklin, N. C., at Clayton, Ga., December 1.

RALPH S. SAPPENFIELD, Brookville, Ind., to Miss Zella Timmons at Pendleton, October 26.

CARL M. PORTER, Linton, Ind., to Miss Genevieve Jeanne Carroll of Indianapolis, recently.

HOWARD M. GANS to Miss Dorothy Evelyn Selman, both of Cleveland, November 22.

Deaths

Leo Kessel ● New York; Columbia University College of Physicians and Surgeons, New York, 1903; member of the American Society of Clinical Investigation; on the staff of the Mount Sinai Hospital; formerly on the staffs of the Montefiore Hospital, Gouverneur Hospital and the Bellevue Hospital; aged 51; was found dead in bed, December 5, of heart disease.

Percy Gilbert Browne, East Bridgewater, Mass.; Boston University School of Medicine, 1892; professor emeritus of diseases of the chest at his alma mater; served during the World War; formerly on the staffs of the Massachusetts Homeopathic Hospital and the Emerson Hospital, Boston, and the Westboro (Mass.) State Hospital; aged 63; died, November 20.

Rolfe Floyd ● New York; Columbia University College of Physicians and Surgeons, New York, 1899; served during the World War; formerly instructor in clinical medicine, Cornell University Medical College; on the staff of the Roosevelt Hospital; aged 59; died suddenly, December 6, of heart disease.

Arthur Nicholson Broughton ● Boston; Harvard University Medical School, Boston, 1897; fellow of the American College of Surgeons; member of the New England Pediatric Society; assistant surgeon to the Faulkner Hospital; aged 61; died, December 3, of heart disease.

Oscar John Reuben Freed ● Cokato, Minn.; University of Minnesota Medical School, Minneapolis, 1917; medical director of the Cokato Hospital; aged 47; died, November 12, in St. Mary's Hospital, Minneapolis, of septicemia and pneumonia.

Elmer E. Burton, Jacksonville, Ill.; Eclectic Medical Institute, Cincinnati, 1891; member of the Illinois State Medical Society; on the staff of the Jacksonville State Hospital; aged 67; died, December 12, in St. Anthony's Hospital, Effingham.

Joseph Baer Fish, Browns Mills, N. J.; Long Island College Hospital, Brooklyn, 1905; served during the World War; medical superintendent of the Deborah Tuberculosis Sanatorium; aged 65; died suddenly, November 25, of heart disease.

Walter C. Brewer ● Columbus, Miss.; Tulane University of Louisiana School of Medicine, New Orleans, 1901; fellow of the American College of Surgeons; owner of the Columbus Hospital; aged 54; was shot and killed, November 28.

Calvin Waldo Harned, Des Moines, Iowa; State University of Iowa College of Medicine, Iowa City, 1906; member of the Iowa State Medical Society; served during the World War; aged 53; died, November 18, of heart disease.

John Michael Bohan ● Galesburg, Ill.; Northwestern University Medical School, Chicago, 1907; on the staffs of the Galesburg Cottage Hospital and St. Mary's Hospital; aged 51; died suddenly, December 9, of coronary thrombosis.

William Henry Davis, Brooklyn; University of the City of New York Medical Department, 1861; member of the Medical Society of the State of New York; Civil War veteran; aged 96; died, December 2, of chronic myocarditis.

Robert Ray Hammond ● Stockton, Calif.; Cooper Medical College, San Francisco, 1897; fellow of the American College of Surgeons; on the staff of St. Joseph's Home and Hospital; aged 58; died, October 3, of coronary sclerosis.

John Pope DeLaney, Geneva, N. Y.; Bellevue Hospital Medical College, New York, 1885; member of the Medical Society of the State of New York; aged 75; was killed, November 30, when he was struck by an automobile.

Richard Cameron McFarland Stewart, Pittsburgh; Western Pennsylvania Medical College, Pittsburgh, 1891; member of the Medical Society of the State of Pennsylvania; aged 66; died, November 11, of carcinoma of the bladder.

Ben Perley Weaver ● Fort Wayne, Ind.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; fellow of the American College of Surgeons; aged 54; died, November 8.

Ulysses Grant Cook, Beckley, W. Va.; University of Louisville (Ky.) School of Medicine, 1891; member of the West Virginia State Medical Association; aged 68; died, November 10, of cerebral hemorrhage.

William Josiah Clark, Russellville, Ala.; Birmingham Medical College, 1895; member of the Medical Association of the State of Alabama; aged 62; died, November 25, in a hospital at Florence.

Eb W. Thomas, Philadelphia; Jefferson Medical College of Philadelphia, 1897; member of the Medical Society of the State of Pennsylvania; aged 74; died suddenly, November 13, of heart disease.

John Kimbrough, Hartselle, Ala.; Memphis (Tenn.) Hospital Medical College, 1913; member of the Medical Association of the State of Alabama; aged 44; died, October 31, of cerebral hemorrhage.

John R. C. Byron, West Haven, Conn.; University of the City of New York Medical Department, 1893; aged 65; died, November 29, in the Grace Hospital, New Haven, of heart disease.

Joseph Leonard Drummey, Watertown, Mass.; Tufts College Medical School, Boston, 1910; physician in the schools of Watertown; aged 47; died suddenly, November 28, of heart disease.

Robert L. Russell, Marlow, Okla.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1902; member of the Oklahoma State Medical Association; aged 63; died, October 18.

Zachariah A. Thompson, Shelbiana, Ky.; Baltimore University School of Medicine, 1905; member of the Kentucky State Medical Association; aged 74; died, November 10, at Lynch.

Rupert Kimmel Welliver ● Dayton, Ohio; University of Michigan Homeopathic Medical School, Ann Arbor, 1908; aged 51; died, November 26, at his summer home in Brooklyn, Mich.

Alexander Isaac Fraser ● Bakersfield, Calif.; University of Southern California College of Medicine, Los Angeles, 1897; aged 64; died, October 6, of diabetes mellitus and furunculosis.

Dugald Stewart, Bridgewater, N. S., Canada; University of the City of New York Medical Department, 1892; formerly mayor of Bridgewater; aged 70; died, November 7.

Warren Jeremiah Hough, National Military Home, Calif.; Ensworth Medical College, St. Louis, 1904; aged 59; died, October 28, of myocarditis and mitral insufficiency.

Thomas C. Bussey, Texas, Md.; College of Physicians and Surgeons, Baltimore, 1893; aged 75; died, November 21, in the University Hospital, Baltimore, of senile gangrene.

Alfred Leslie Casburn, Ferris, Ill.; University of Kansas School of Medicine, Kansas City, 1906; aged 49; died, November 25, of glomerular nephritis and hypertension.

Fred Stevens Smith ● North Andover, Mass.; Harvard University Medical School, Boston, 1895; chairman of the school committee; aged 62; died, November 2.

Calvin La Fayette Cooper ● Kansas City, Mo.; University Medical College of Kansas City, 1898; city health officer; aged 61; died, December 1, of heart disease.

Grover Latham Howard, Prestonsburg, Ky.; University of Maryland School of Medicine, Baltimore, 1911; aged 48; died, November 27, of cerebral hemorrhage.

Ned McGuire Fuller ● Desloge, Mo.; Tulane University of Louisiana Medical Department, New Orleans, 1911; aged 47; died, November 19, of bronchopneumonia.

Susanna Long Bryant, Columbus, Ohio; Hahnemann Medical College and Hospital, Chicago, 1899; aged 66; died, December 6, of chronic paranephritis.

Arthur Amin Prall, Huntington Park, Calif.; Drake University Medical Department, Des Moines, 1888; aged 72; died, November 5, of cirrhosis of the liver.

Luther S. Hall, Oregon, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1876; aged 82; died, December 16, of arteriosclerosis and myocarditis.

Clifford Spencer Powell ● Deer Lodge, Mont.; Rush Medical College, Chicago, 1917; aged 42; died, October 31, in Chicago, of cerebral hemorrhage.

John Camp Butler, Baltimore; University of Maryland School of Medicine, Baltimore, 1882; aged 71; died suddenly, December 2, of heart disease.

William Howard Bray, Denver; University of Colorado School of Medicine, 1932; aged 34; died, September 25, in the Colorado General Hospital.

Marea Henrietta Brokhaus, West New York, N. J.; New York Medical College and Hospital for Women, 1889; aged 65; died, October 9.

Charles Thompson Noble, Sutton West, Ont., Canada; Victoria University Medical Department, Coburg, 1856; aged 102; died, in November.

Ernest Fletcher Clymer, White Plains, N. Y.; Dartmouth Medical School, Hanover, N. H., 1896; aged 60; died, December 16, of heart disease.

Theodore Barnes, Blockton, Iowa; Eclectic Medical Institute, Cincinnati, 1908; aged 69; died, October 20, of burns received in an explosion.

James William Lewis, Bowling Green, Ky.; Vanderbilt University School of Medicine, Nashville, Tenn., 1903; aged 59; died, September 16.

William James Austin, Perry, N. Y.; Niagara University Medical Department, Buffalo, 1895; aged 54; died, November 20, in Warsaw.

Stephen Nicholas Howser, Clarksville, Tenn.; Vanderbilt University School of Medicine, Nashville, 1891; aged 70; died, October 29.

Leroy Brown, St. Paul; University of Michigan Medical School, Ann Arbor, 1885; aged 77; died, November 22, in the Ancker Hospital.

J. Frank Dickerson, St. Louis, Okla. (licensed, Oklahoma, under the Act of 1908); aged 57; died suddenly, November 14, of heart disease.

George W. Farquhar, Belleville, Pa.; University of Pennsylvania School of Medicine, Philadelphia, 1894; aged 62; died, November 7.

Joseph Blum, New York; University of Maryland School of Medicine, Baltimore, 1885; aged 71; died, December 11, of heart disease.

Joseph P. Woodward, Buford, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1895; aged 57; died, October 23.

John H. Rinehart, Worthington, W. Va.; Starling Medical College, Columbus, 1887; aged 72; died, October 25, of lobar pneumonia.

Ezra H. Sheaffer, Vancouver, Wash.; State University of Iowa College of Medicine, Iowa City, 1874; aged 81; died, October 31.

Thomas Francis Ash, Rockland, Mass.; Tufts College Medical School, Boston, 1902; aged 65; hanged himself, October 10.

Torsten Ohrbom, Menahga, Minn.; Kejserliga Alexanders Universitet, Helsingfors, Finland, 1902; aged 59; died, December 1.

Allan Samuel Nicholson ● Castle Rock, Wash.; National Medical University, Chicago, 1905; aged 50; died, November 14.

Sumner Percival Rugg, Auburn, Calif.; Bellevue Hospital Medical College, New York, 1879; aged 79; died, October 14.

Gustavus V. Cate, Brunswick, Ga.; College of Physicians and Surgeons, Baltimore, 1888; aged 70; died, October 2.

James Hallam Cope, Pleasanton, Calif.; Oakland College of Medicine and Surgery, 1909; aged 59; died, October 29.

J. O. Georges Piché, Montreal, Que., Canada; School of Medicine and Surgery of Montreal, 1903; died, October 7.

John Aaron Taylor, Gridley, Ill.; Bellevue Hospital Medical College, New York, 1875; aged 82; died, November 1.

James F. Preston, Grinnell, Iowa; Long Island College Hospital, Brooklyn, 1875; aged 83; died, November 7.

S. Bryant Chumbley, Arthur, Ind.; Kentucky School of Medicine, Louisville, 1893; died, September 1.

Frank Wenz ● Rathdrum, Idaho; Detroit College of Medicine, 1889; aged 69; died, November 6.

Edwards Bates, Lincoln, Neb.; Chicago Medical College, 1884; aged 82; died, September 6.

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Correspondence

FOUNDATIONS AND REPORT OF COMMITTEE ON COSTS OF MEDICAL CARE

To the Editor:—In the issue of THE JOURNAL for December 3 appears an able editorial on the Committee on the Costs of Medical Care. In this editorial are references to "the eight foundations that contributed financial support" and also, later in the editorial, on page 1952, a further reference to "the great foundations" as supporting the principle of socialized medicine.

In order that members of the medical profession may clearly understand that the Commonwealth Fund is not included among the foundations mentioned, I should like to make the following statement:

1. The Commonwealth Fund, although repeatedly requested to do so, has not made any appropriation directly or indirectly to the Committee on the Costs of Medical Care.

2. The Commonwealth Fund does not subscribe to or approve of the program of the majority report looking toward the establishment of socialized medicine.

3. The Commonwealth Fund agrees fully with the attitude expressed by the minority report on the subject of public health, as stated in the second paragraph on page 152 of the minority report.

The policies of the Commonwealth Fund in its public health work are given in detail in the book Child Health and the Community, published by the Fund in October, 1931, which received lengthy and favorable comment in THE JOURNAL, Jan. 2, 1932.

I write this letter not for the purpose of criticizing any person or group of persons but solely in order that practicing members of the medical profession may have a clear understanding as to the attitude and policy of the Commonwealth Fund toward the profession and its work.

BARRY C. SMITH, New York.
General Director, the Commonwealth Fund.

CORRECTION OF PROGNATHISM OF THE LOWER JAW

To the Editor:—In THE JOURNAL, Dec. 3, 1932, page 1917, Drs. Pettit and Walrath describe what is purported to be a new surgical procedure for the correction of prognathism of the lower jaw. The operation described by them as original is by no means new but appears to be identical with that described by Dufourmentel in the *Presse médicale* (**29**:235 [March 23] 1921) and also in his monograph on "Chirurgie de l'articulation temporo-maxillaire," published by Masson et Cie in 1929. In American literature reference has been made to Dufourmentel's procedure by me in Nelson's Loose-Leaf Surgery (vol. II, chapter XI). Pettit and Walrath show a further unfamiliarity with the literature on the subject by several inaccurate statements. For example, they state that in operations heretofore described the bone fragments after section are fastened together with wires or plates or other foreign material, and also that no one has ever reported a series of successful cases. Among others reporting series of successful cases in addition to Dufourmentel are Henschen and Schwarz (*Chirurg* **1**:56, 1928), Pichler (Handwörterbuch der gesamten Zahnheilkunde, Leipzig **4**, 1931), Kostecka (*Zahnartzliche Rundschau* **40**:670, 1931) and Kazanjian (*Internat. J. Orthodontia, Oral Surg. & Radiography* **18**:1224, 1932). Attention was called in my article in Nelson's Loose-Leaf Surgery to the various procedures advocated, and the advantages and disadvantages of each. I have done the condyle section in two cases, in one with a successful result, but in the other I was unable to carry the lower jaw back sufficiently far. The operation of choice, in my opinion, is the horizontal section up in the ascending ramus, above the point of entrance into the bone of the inferior dental nerve and vessels, which has all the advantages claimed by Pettit and Walrath for the temporomandibular arthroplasty, and none of its disadvantages. This letter is in no way intended to disparage the excellent result obtained in the case described.

ROBERT H. IVY, M.D., Philadelphia.

TOLERANCE OF GALACTOSE BY DIABETIC PATIENTS

To the Editor:—In a recent issue of THE JOURNAL (Nov. 19, 1932, p. 1799) is a communication from Shay commenting on an editorial comment in the September 3 issue of THE JOURNAL on the tolerance of galactose by diabetic patients. The editorial in question was inspired by a report from Roe and Schwartzmann (*J. Biol. Chem.* **96**:717 [June] 1932) in which the authors stated that they had been unable to confirm a sex difference in the tolerance for this sugar that had been previously reported by me. (Bibliography in part: *Arch. Int. Med.* **34**:388 [Sept.] 1924. *Am. J. Obst. & Gynec.* **16**:687 [Nov.] 1928; **17**:351 [March] 1929. THE JOURNAL, Oct. 22, 1927, p. 1403. *Am. J. M. Sc.* **179**:761 [June] 1930.)

The technic that I have prescribed for the estimation of the tolerance calls for preliminary controlled feeding of the patient for a sufficient period to insure an adequate carbohydrate reserve in the body, and then the determination of the minimum dose producing galactosuria by the administration, over a series of successive days, of individual test meals differing from each other by 10-Gm. intervals. Further, when normal controls were the subjects, their normality was established by thorough preliminary clinical and laboratory studies and not assumed on the basis of occupation or opinion.

Roe and Schwartzmann administered a single dose of galactose, giving an amount determined by the body weight of the patient, and varying from 44 to 75 Gm. (the average was 63 Gm.), all of which were supertolerance doses, in most instances approaching or exceeding a 100 per cent excess. They recovered from 0.91 to 2.78 Gm. in a two-hour collection.

On the basis of these ten experiments and seemingly in complete ignorance of the so-called carbohydrate paradox (Allen: Glycosuria and Diabetes, Boston, W. M. Leonard, 1913) the authors courageously conclude that there is "no evidence in these results of a higher tolerance for galactose in women than in men." As this work was so obviously incompetent to warrant any opinion on the question of a sex difference, the form of study being peculiarly adapted to mask any such, I felt it unnecessary to comment on the paper at the time of its appearance. In Shay's letter, however, after a lengthy disagreement, both with Roe and Schwartzmann's work and with the editorial based on it, he comments to the effect that "it is interesting to note that Roe and Schwartzmann were unable to find a higher tolerance for galactose in women than in men, as stated by Rowe. We had previously pointed out this fact." The paper to which Shay makes reference (Shay, Harry; Schloss, E. M., and Bell, M. A.: The Metabolism of Galactose, *Arch. Int. Med.* **47**:391 [March] 1931) was a study of the suitability of galactose as a medium for testing liver function. This had its genesis in the work of Bauer (*Wien. med. Wchnschr.* **56**: 20, 1906), who first suggested the use of this sugar for this purpose. Bauer's criterion for an exceeded tolerance was the appearance in the urine of more than 3 Gm. of the sugar.

Shay administered 40 Gm. alike to a series of presumed normal men and women (fifteen each) and recovered varying amounts from the urine, the range being from 0.00 to 2.20 Gm. The female average was 0.64; that of the male, 0.88. Shay's statement (p. 393) that "the normal person may excrete in the urine from none to 3 grams of sugar in the five hours after the administration of 40 grams of galactose" obviously is based

on the faulty Bauer criterion of 1906, at which date ignorance of the "carbohydrate paradox" was excusable. In the light of present knowledge, however, Shay's conclusion that "it becomes evident . . . that there is practically no difference between the sexes in their tolerance for this sugar" is patently an assumption not warranted by his own incomplete observations.

Under ordinary circumstances, this report, like that of Roe and Schwartzmann, could have been passed by without notice, as the group interested in the scientific aspects of galactose metabolism are wholly informed of all the facts in the matter and are thus able to reach independent conclusions as to the validity of such criticism. The growing general interest in the metabolism of this sugar, its present availability in a pure form and its application to both diagnostic and therapeutic procedures, however, warrants a word of correction to erroneous conclusions deriving from studies unrelated to the original investigations which they criticise adversely and with the results of which the several authors are seemingly but imperfectly acquainted. My conclusions as to the metabolism of galactose are based on results obtained from the thorough study of well over four thousand individuals as one feature of an elaborate program designed for diagnosis or for the definition of the limits of normal control.

ALLAN WINTER ROWE, PH.D., Boston.

THE RED CROSS AND ARTIFICIAL RESPIRATION

To the Editor:—In rereading some copies of THE JOURNAL I find an editorial comment entitled "Physiologic Death and Artificial Respiration (April 23, p. 1471). The statement is made that "public utility companies could render a still greater public service if they would offer to provide instruction to the public in the proper methods of artificial respiration."

I want to give the doctors a clearer idea of just what is being done by our First Aid Service and to explain the plan and purpose of its work.

The American Red Cross First Aid Service was originated in 1910. The primary purpose is accident prevention in that it has been found that persons trained in first aid are safer workmen. Secondly and almost equally important is proper first aid until medical aid is secured. This includes such important measures as artificial respiration, digital pressure for control of bleeding, and proper transportation and treatment both of and to prevent shock. The minimum recognized period of instruction is fifteen hours, which includes considerable practice work.

In the beginning, all instruction was given by physicians. This had two very serious defects: 1. The physician's chief duty is care of the sick and injured and this often interfered seriously with his meeting a class. 2. Unless the physician was willing to spend considerable time and effort in preparing his material, he would continuously use technical terms his students did not understand and he was apt to attempt to teach diagnosis and treatment instead of first aid suitable to laymen. Many physicians have done and are doing much excellent teaching.

As a result of these defects, the plan of using lay instructors as well as physicians was devised. Carefully selected laymen are given a minimum of thirty hours' training, at least half of which must be under the supervision of a well trained, licensed physician who has given considerable time to organizing material and teaching lay first aid. The layman is given definite practices to follow and an attempt to teach several ways of handling the same situation is discouraged. Receiving at least half of his training under a physician familiar with first aid practices, he knows clearly the difference between lay first aid and medical treatment and the limits of the former. As a whole, the instruction given by these lay instructors is highly satisfactory.

The First Aid Service of the American Red Cross attempts to do two things: 1. To furnish a program. This includes a textbook, teaching guide and charts. The textbook is now being rewritten. The information is kept well up to date. The Fracture Committee of the American College of Surgeons reviewed the chapter on fractures. The American Gas Association, National Electric Light Association, Dr. Henderson of Yale and Dr. Drinker of Harvard all assisted in furnishing material on asphyxiation. Dr. Dudley Jackson furnished the material on snake bite. 2. To train instructors. This is done by the Red Cross First Aid Service staff physicians all over the United States at no charge to the groups concerned.

The leading public utility companies, including the Associated Gas and Electric System, Appalachian Electric Power Company, Cities Service and the American Telephone and Telegraph and its associated companies, make use of this service. Their instructors are primarily to train their own employees but they also conduct many classes for persons in the community not associated with the companies.

Many schools and colleges are using our service and the number is growing rapidly. The public school nurses taking summer work in the University of the State of New York, the physical education teachers of Cincinnati and the health and physical education teachers of Baltimore are typical groups. The physical education students in many schools and colleges are given this work as part of the required course of study with the thought that they should be able to teach first aid in the public schools.

Since its inception, the First Aid Service has through its instructors trained more than 566,220 persons. The Life Saving Service, which teaches of water safety, water rescue and resuscitation in all forms of asphyxiation, has trained more than 408,675 persons.

Strangely enough, when a case does occur, the physician summoned to the scene of the accident not only often shows gross ignorance of handling an asphyxiation case but also sometimes interferes with the work of the trained layman. Any physician who will read Dr. Yandell Henderson's article on "Resuscitation" in THE JOURNAL, Sept. 6, 1924, page 758, will realize the importance of not stopping the resuscitation so that he can make an examination, the uselessness of hypodermic medication, and the importance of not stopping work until rigor mortis sets in. For instance, many physicians don't know that a body is frequently rigid immediately after electrical shock and that many of the patients will limber up in fifteen or twenty minutes and can often be saved.

In our work we are attempting to prevent death and mitigate suffering and long convalescence by (1) having trained persons available in dire emergencies, such as asphyxiation; (2) getting the patient to the doctor in the best possible condition for the doctor's work; (3) teaching the public safe ways to care for minor injuries which will not be taken to the doctor and showing them the fallacies of false theories and claims shouted nightly by the radio.

We earnestly request the continued support of the physicians of this country in the work we are doing.

EUGENE E. WILLISON, M.D., Washington, D. C.
Staff Physician, First Aid Service,
American National Red Cross.

"LYMPHOPATHIA VENEREA"

To the Editor:—I note Dr. Sulzberger's communication on "Lymphopathia Venerea" in THE JOURNAL, Nov. 26, 1932, page 1880. This is the nineteenth name so far suggested for this disease. "To him that hath shall be given." May I suggest two more? "Lymphopathia contagiosa," thus sidestepping the occasionally undeserved implication of a venereal origin, or, for those who like long names, "Lymphopathia contagiosa purulenta cicatrizans." JOSEPH GRINDON, M.D., St. Louis.

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Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

HYPERSENSITIVITY OF FINGER TIPS

To the Editor:—A white girl, aged 13, of a decidedly neurotic type although not retarded in school, is the youngest of three girls, all of whom show some defect. The parents come from what are termed "queer" families, and although not legally separated cannot get along with each other. This child complains of extremely sensitive finger tips. They are so sensitive that she will not cut her nails until they are at least a quarter of an inch long. They must be cut and not filed, and the cutting gives a great deal of pain. She is sensitive about her nails, and any reference to them by her schoolmates causes emotional distress. Either hot or cold water is painful. In a school examination (I am a part-time health commissioner) the need for an eye correction, which has been made, was found. The tonsils, adenoids and the teeth have been given attention. Personal hygiene is good and she gets a good amount of sleep. She has taken an iron tonic with good results for some 3 per cent underweight. The neurosis seems to be that of fear, criticism, fingers, school examinations, even the next day's lessons. Her mother is well educated and we got her through the last examinations better than usual. If any one can make any suggestion, I should be glad to receive it. Please omit name.

M.D., Ohio.

ANSWER.—In the absence of any local or general cause for the sensitiveness of the finger tips, it is probable that this condition is of psychic origin. This is rendered the more probable by the emotional distress associated with reference to them, and also by the fact that there has been unhappiness in the home. A psychiatric study by a competent psychiatrist or at a child guidance clinic is indicated.

CALCIUM-PHOSPHORUS METABOLISM

To the Editor:—Will you kindly give me some information relative to calcium and phosphorus metabolism and physiologic activity, as follows: 1. The physiologic mechanism by which calcium deficiency causes increased irritability and increased calcium metabolism results in lessened irritability; that is, does the calcium act directly on muscle fibers or on motor nerves? If the latter, where does this action take place? Is there any evidence that calcium has any effect on reactions of the central nervous system? 2. Is there a relationship between calcium metabolism and phosphorus metabolism and irritability, nervousness and effective reactions as shown in mental disease; for instance, epilepsy? Have prescriptions of calcium, phosphorus and vitamin D been used therapeutically in the treatment of such conditions? If so, what? 3. Is there any relationship between a deficiency in calcium metabolism, hypothyroidism, hypotension and anemia and a delay in lactic acid elimination? 4. What are the skin manifestations in children or adults due to a deficiency in calcium and phosphorus metabolism? Any references would be appreciated. Kindly omit name.

M.D., Rhode Island.

ANSWER.—1. The statement is usually made that diminished calcium metabolism, as shown by a decrease in serum calcium, results in an increase in irritability of the neuromuscular apparatus. The isolated heart perfused with calcium-free nutrient fluid stops beating in systole; as sugar continues to be used by the contracted cardiac muscle and electrical charges remain strong, it appears that the utilization of chemical energy for contraction depends on the presence of the calcium ion. Again, the muscle twitches following the precipitation of calcium by certain sodium salts cannot be abolished with curare and it was therefore concluded that they were myogenic. However, calcium is important in the conduction of the nerve impulse across the neuromuscular junction and through the synapse. Furthermore, a deficiency of calcium increases the irritability of the termination of the autonomic nerves in mammals. One can conclude from these observations that the locus of activity, so far as its influence on neuromuscular physiology is concerned, is in both tissues.

Tetany, the salient clinical syndrome constituting an acute response to lowered serum calcium, is due to a hyperexcitability of peripheral nerves and usually is not accompanied by cardiac insufficiency or disturbances of the central nervous system.

2. There is little, if any, convincing evidence that there exists a relationship between calcium and phosphorus metabolism and the more common mental diseases. There is no constant variation in the concentration of serum calcium in these conditions nor is there a relation between serum calcium and the fits in epilepsy. Both calcium chloride and ammonium chloride have been used to reduce the number of epileptic seizures, the favorable results depending on the acidifying action of these salts. From 10 to 15 Gm. daily of calcium chloride for ten days has been employed to induce acidosis in epilepsy. A parallel decrease in the bicarbonate level in the serum and in the number of attacks has been reported in patients who show a favorable response.

3. When the concentration of calcium in the serum is diminished 40 per cent or more, signs of tetany appear, there results an increase in lactic acid production and the serum bicarbonate diminishes. Hyperthyroidism is accompanied by an augmented consumption of oxygen, a decrease in serum calcium and an increase in lactic acid in the blood. Hypothyroidism is characterized by a lowered oxygen consumption, an increase in serum calcium and, presumably, a diminished production of lactic acid.

Interference with the delivery of oxygen to the tissues results in an increased production of lactic acid. Thus, cardiac insufficiency, hypotension and a subnormal amount of hemoglobin (anemia) are accompanied by the accumulation of lactic acid in the blood. The effectiveness of the acid-base regulating mechanism is shown by the fact that, after severe hemorrhage, the accumulated lactic acid is removed before the oxygen-carrying capacity of the blood is restored.

4. Although much has been written on the relation of calcium and phosphorus metabolism to various skin diseases, the more recent biochemical studies indicate that the concentration of these elements in the serum of patients with dermatologic disturbances is generally normal.

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SYPHILIS AND VINCENT'S ANGINA

To the Editor:—I have been treating a patient who has Vincent's angina. September 5, I gave him 0.6 Gm. of neoarsphenamine. After he received this injection he called my attention to a small red lesion on the shaft of the penis. He first noticed it, September 3. It remained about the same in character and felt rather raw to the patient, as if he had scratched it. This lesion, September 6, was red, flat with the skin, and from 2 to 3 mm. in diameter. There was no discharge, no ulceration, and absolutely no induration. He has a stubborn case of tinea cruris, and he applied 10 per cent ammoniated mercury to the penis. This seemed to irritate the lesion more. A few almost invisible scales were noticed. At no time did it have a blue or copper tint. It has now faded and left a very slight brown spot. It itched slightly and pained some. The Wassermann reaction is negative. He rooms with his brother, who had a typical chancre about a month ago. They shared baths and towels. If this is a true chancre, would one injection of neoarsphenamine cause its disappearance in forty-eight hours? Should I treat this case as syphilis without waiting for another Wassermann test? It seems to me that a true chancre would not disappear in five or six days. It also had no characteristics of a chancre. Please omit name and address.

M.D., Oklahoma.

ANSWER.—This case is certainly an unfortunate combination and it is difficult to see how, without risk of perhaps serious relapse, it will be possible to determine whether the described penile lesion was a chancre or not. For such a decision a dark field examination and not the physical characteristics of the lesion would be the only entirely convincing evidence. It would be easily possible for a single injection of neoarsphenamine in the dosage named to cause the disappearance of so small a lesion within forty-eight hours, for the chancre may vary in appearance from a minute erosion to a large indurated plaque. The question might also be raised as to whether the Vincent's angina was bona fide or was syphilis masquerading as a Vincent infection. The negative Wassermann reaction, however, makes it seem improbable that syphilis was responsible for the angina.

The question as to whether under these circumstances the patient should take treatment for syphilis must to some extent be decided by the patient himself. He should be told of the risks he will run if relapse is permitted to occur, supposing he has a syphilitic infection. He must also be told that if he goes on with treatment for syphilis it must be carried through with all the thoroughness and energy appropriate to a seronegative

primary case, precisely as if the diagnosis had been clinched by dark field. Any intermediate course is likely to lead to relapse and possible disaster. All things considered, under the circumstances described, while the lesion does not suggest a primary infection and might be a phase of the dermatophytic infection of the groin, the risks involved in a relapse are so serious that neither physician nor patient could be criticized for determining to play safe and take systematic treatment.

SENSITIVITY TO OR ANNOYANCE BY FUMES OF TOBACCO

To the Editor:—I have a patient, aged 44, a grain dealer, who for a number of years has found it impossible to be around anybody who smokes cigarets. They at first give him a headache, followed by nausea and vomiting if he does not get away from the smoke-laden air. He smokes himself but uses a pipe and says he does not notice any ill effects from it. Camel cigarets affect him the most and Chesterfields the least, with Old Gold and Lucky Strikes in between. Needless to say he finds his social activities restricted and he cannot go to any place where men gather; he even finds it necessary to prohibit anybody from entering his office smoking a cigaret. He thinks it must be the Turkish tobacco. What, if anything, can be done to desensitize him? Would it be possible and the correct thing to do to get made up some extract of cigaret tobacco, and give it to him in increasing doses? If so, where could I get the extract made? Can you suggest anything else to do for him?

A. W. PATTERSON, M.D., Fonda, Iowa.

ANSWER.—The patient's complaints raise the question whether the symptoms are due to hypersensitiveness to tobacco or whether tobacco fumes affect him in a nonspecific way, much as might any fumes, such as ordinary smoke or coal gas. Probably ninety-nine out of a hundred persons who have trouble from tobacco smoke are affected nonspecifically, and in these cases the results of attempts at desensitization should not be good. In the few cases, however, in which real allergy (hypersensitiveness) exists and skin tests for tobacco are positive, desensitization has been tried with apparently some good results. The best procedure is to make a cutaneous test for tobacco; if it is negative, intracutaneous tests should be made with dilutions of 1:1,000, 1:100 and 1:10. If these too are negative, treatment would not be indicated. If positive, however, desensitization injections should be started with that dilution which just fails to give a reaction, and dosage should be increased about 50 per cent until a dilution of about 1:10 is reached. Precautions are essential, as in any desensitization work. The materials can be purchased from the pharmaceutic houses that make them.

EXPOSURE TO RADIUM

To the Editor:—I purchased 50 mg. of radium element from the U. S. Radium Corporation. They delivered it in a lead box which they said was enough protection. For the past ten to twelve months I have been keeping it in my office desk about 18 to 24 inches from where I sit. There is no erythema or depilation. Can you tell me how to go about finding out whether I have absorbed enough rays to cause constitutional disturbances? If you cannot tell me, please give me the name of the doctor or physicist who worked with people that worked in the radium plant in New York. I shall appreciate any information you can give me. Please omit name and city.

M.D., Georgia.

ANSWER.—The possible danger depends on the amount of time during which the inquirer sat at his desk during the twelve months the radium was stored in his desk, and also the thickness of the lead making up the box containing the radium, as well as the thickness and character of the metal in which the radium units are immediately contained. The first step to find out whether any deleterious effect has been produced is to have a complete blood count, including a differential count, and also a study of the smears of blood by an expert hematologist. The leukocytes most likely to be affected are the lymphocytes and the polymorphonuclear cells. If these show any notable decrease in number, the problem would then be to ascertain whether there is any other possible cause for such decrease. If not, the natural assumption would be that the decrease is due to irradiation; such an assumption would not necessarily be correct, although it would be safer to work on the assumption and take no chances. Certainly, radium should not be stored within 18 or 24 inches of a person unless extraordinary precautions in the method of storage are taken. If the blood does not show any evidence of deleterious effects, the only other step would be to have the radioactivity of the inquirer's body actually measured by physical means.

Dr. Harrison S. Martland, City Hospital, Newark, N. J., has done much to call attention to certain occupational dangers connected with the use of radium preparations, such as in the painting of so-called radium watch dials to make them visible at night.

HAZARDS OF COKE DUST

To the Editor:—I am interested in a commercial coke plant, preparing coke for domestic use. In the crushing and handling of this coke, considerable dust results. Respirators are furnished the men working in the plant, but they do not like to wear them on account of the heat and the difficulty in breathing. I should like to know just what harm, if any, might be expected from breathing or inhaling this coke dust. Is the carbon in this dust injurious, or is it absorbed and thrown off during respiration? May a certain amount of anthracosis be expected from the solid particles taken into the lungs by respiration? Any information you are able to give me on this subject will be appreciated. Please omit name.

M.D., West Virginia.

ANSWER.—All dusts are harmful when taken into the respiratory tract. The order of magnitude of danger from coke dust is, however, low. If silica dust is rated at 100 as an index of harmful qualities, the relative figure for coke approximates 5.

"Contrary to popular belief, coal forms an essentially harmless dust. Coal miners live a length of life equal to other persons in coal mining areas. Coal dust particles are not especially irritating from their mechanical action, being relatively soft and without sharp edges. Coal dust creates a low-grade inflammation of the respiratory tract, which tends to its upward extrusion. Large deposits of dusts may reach the lungs and lead to anthracosis, but the severity of this pneumonoconiotic condition is such as to be insignificant in the great majority of cases. For these reasons coal dust is regarded as a minor hazard in this industry, except under circumstances involving the presence of silica or pyrites along with coal. . . . Coke dust is likewise without specific toxicity. The dust particles, however, are harder and sharper edged than coal dust, for which reason mechanical irritation of the eyes and respiratory tract may be of greater severity."

Among coke workers inhaling considerable quantities of dust, higher rates than normal may be expected for all acute respiratory diseases. Years of exposure will eventuate in a low degree of pulmonary fibrosis. The hazards of coke making are discussed in a publication entitled Coke and By-Products, published by the Retail Credit Company of Atlanta, Ga., February and March, 1929.

NUCLEATED ERYTHROCYTES

To the Editor:—Will you please settle a discussion for our medical society? What is the etiology of nucleated red cells? I should also like to know where I can get the latest work on hematology, or study of blood both normal and pathologic.

G. GLENN WHITE, M.D., San Diego, Calif.

ANSWER.—There are several points in relation to the appearance of nucleated red cells in circulation which are not well understood. From what is accepted it may be stated that the presence of nucleated erythrocytes is significant of an extreme degree of bone marrow stimulation and hurried manufacture of red blood cells. They may therefore be noted in any severe anemia without being per se pathognomonic of any one particular type. There are many factors which influence the appearance of nucleated red cells in circulation. The age of the patient, the condition of the bone marrow, and the nature and chronicity of the stimulus are some of the factors. The condition of the bone marrow prevailing in the early years of life are those which in the adult are extant under circumstances of unusual demand for red blood cells. Therefore, the appearance of nucleated red cells has a decreasing significance in the younger individual. Under normal conditions in late childhood and in the adult, the large majority of nucleated red cells in the bone marrow are held at a relatively mature normoblastic level. However, in direct proportion to increased destruction or other bases of demand for increased production of red blood cells, granting the ability of the bone marrow to respond, there is a proportional increase in nucleated forms. It has been the contention of a group of German hematologists that megaloblasts do not occur in the normal regenerating marrow and are pathognomonic of pernicious anemia. While it is true that they are most constantly present during a crisis in the latter disorder, it is the general opinion of hematologists that they may be found in all forms of severe anemia, provided regeneration is vigorous. Outside of the anemias, nucleated erythrocytes may be found in blood conditions in which there is crowding of the bone marrow by proliferation of other cells, as in leukemia and in tumors involving the bone marrow. The appearance of nucleated red cells after splenectomy, lowered oxygen tension, violent physical exertion and shortly before death is still not definitely accounted for, although some excellent ideas have been advanced to explain their presence.

The latest views on normal and pathologic hematology appear in "Recent Advances in Hematology" by Piney and in the sections on hematology in any one of the large systems of medicine. For an exhaustive presentation of the subject, the fifth edition of Naegeli is recommended.

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SCHICK TESTS

To the Editor:—What is the opinion of authorities regarding the retesting of school children who had the Schick test five years ago? Is another Schick test advised after that length of time in children who were found to be immune? This question was asked me by a school nurse. I do not find anything in the literature which I have and would be pleased to have a reply. If the reply is made through THE JOURNAL, will you please omit my name and address.

M.D., Iowa.

ANSWER.—When immunization with diphtheria toxin-antitoxin was first used, it was important to know the duration of the secured immunity. Park, Zingher and others in New York, where much of the early work was done, made extensive observations regarding this matter in institutions where inmates remained in residence for several years. They determined that in immunized children the protection lasts in at least 90 per cent for more than six years and probably for the remainder of life. There seemed to be no difference in this respect between the immunized children and those who developed antitoxin naturally. They thought that the proportion in which immunity is permanent was greater than 90 per cent, the discrepancy being due to inaccurate Schick tests (THE JOURNAL, Nov. 4, 1922, p. 1584). It has come to be generally accepted that immunity, as shown by a negative Schick test, lasts many years, carrying a child over the period when danger from diphtheria is greatest, and that routine retests are unnecessary. In the presence of special danger of infection, a retest might properly be made as a precaution against reliance on the results of a former test, which may have been inaccurate.

APHTHOUS STOMATITIS

To the Editor:—A stenographer, aged 23, has recurrent ulcers of the lips and tongue. Her general health has always been good, but rich foods cause frequent indigestion and heartburn. The bowels are moderately constipated. The past history is otherwise negative. The present illness began about four years ago, but she has always had many canker sores. Ulcers come and go; when some are cured, others appear, of increasing severity. They are located on the tip and sides of the tongue and on the gums. There is no history of trauma. There is no industrial exposure. On examination four months ago she was well nourished and weighed 115 pounds (52 Kg.). The mouth showed three ulcers, two on the anterior part of the tongue, one on the upper lip inside. These were serpiginous and had nonundermined, punched out, slightly indurated sharp cut walls with a grayish floor covered by a little exudate. The largest ulcer was 1.5 cm. in diameter. There was no special odor to the breath. There was no glandular enlargement. Urinalysis gave negative results. Blood examination revealed: hemoglobin, 84 per cent; erythrocytes, 4,710,000; leukocytes, 8,900, of which large lymphocytes constituted 3 per cent, small lymphocytes 30 per cent, neutrophils 65 per cent, eosinophils 1 per cent, and monocytes 1 per cent. The Wassermann reaction was negative. Direct smear of the ulcers showed only a few leukocytes and few large bacilli. No spirochetes were observed. Biopsy of several pieces from the base and margins of the largest ulcer, May 13, did not give definite information about the etiology. Tuberculosis could be excluded and there was nothing typical of syphilis. A special Levaditi stain for spirilla showed some Vincent's organisms. The number found was suggestive of a true Vincent infection. The Gram stain revealed streptococci and staphylococci in the upper layers of the ulcers. The diagnosis was chronic ulcer of the upper lip. Treatment consisted of sodium perborate given the patient with instructions to use it at home several times daily. Local applications of 25 per cent silver nitrate and of gentian violet crystals were made in the office. On one occasion 0.4 Gm. of sulpharsphenamine was given in the buttock and on two other occasions 0.45 Gm. of neoarsphenamine intravenously. General supportive treatment included yeast, cod liver oil, dietary measures and an anticonstipation regimen. The original ulcers healed promptly, but since then several others have appeared and her condition remains unimproved though the general health is excellent. What is the diagnosis? What treatment can you suggest in this stubborn case? What is the prognosis? Any suggestions will be much appreciated. Please omit name.

M.D., Kansas.

ANSWER.—The description of this case suggests the probability of an aphthous stomatitis, commonly referred to as canker sores. These lesions are usually sensitive, somewhat in contrast to many other lesions of the oral mucous membrane. The inquiry does not state whether that is true of this case. The local application of boric acid and silver nitrate is an acceptable method of treatment. Other mild astringents may also be used. They probably act chiefly by forming a protective pellicle and thus promote healing. It is likely that the lesions are the result of a mild functional digestive disturbance, although the exact nature of this is not fully understood. There is considerable evidence that the vegetative nervous system may be a marked factor, as the lesions are often seen in the asthenic type with sedentary habits, either by inclination or because of occupation. Not uncommonly there is an associated gastric hyperacidity. The patient should therefore be encouraged to lead an active outdoor life; it may even be necessary to change her occupation. Meals should be eaten regularly and contain a considerable proportion of vegetables. The prolonged use of mercury with chalk as 0.03 Gm. tablets three times a day has given good results. When hyperacidity is present, alkalization by sodium bicarbonate and magnesium oxide may be given a trial. The use of pills of ferrous carbonate and other iron preparations is worth while.

Sutton has described a relatively rare ulceration of the oral mucous membrane under the term periadenitis mucosae necrotica recurrens, which somewhat resembles a severe aphthous stomatitis. There is some suspicion that a profound neurotic disturbance may be the etiologic factor. Others are more inclined to look on it as a tuberculid. This disease runs its course without being materially influenced by any known therapeutic measures, although general roborant treatment is indicated.

CORRELATION OF BASAL METABOLIC RATE WITH PULSE PRESSURE

To the Editor:—In THE JOURNAL, recently, I noticed an explanation of a calculation of the basal metabolic rate based on pulse pressure, the formula being B. M. R. = 0.683 (pulse rate plus 0.9 pulse pressure)—71.5. Please explain how the basal metabolic rate would be calculated from this formula. Why the 0.683?

C. E. ETHERIDGE, M.D., Morrilton, Ark.

ANSWER.—In 1922, J. Marion Read of Stanford University School of Medicine published an article in THE JOURNAL on the correlation of basal metabolic rate with pulse rate and pulse pressure and computed the coefficients of correlation between the basal metabolic rate and the pulse rate, and pulse pressure and pulse rate. The coefficient was calculated on the basis of unity representing perfect correlation, standard statistical methods being used.

The first formula determined was: basal metabolic rate = 0.683 (pulse rate + 0.9 pulse pressure) — 71.5. In 1924, after further studies, this was revised to read: basal metabolic rate = 0.75 (pulse rate + 0.74 pulse pressure) — 72, which gives the basal metabolic rate within 10 per cent of its correct value in slightly more than half of the cases. In 1931 the Gales revised the formula to pulse rate + pulse pressure — 111 = basal metabolic rate, which, they asserted, was admirably adapted for use at the bedside.

Further details are given in the following original articles:

Read, J. M.: Correlation of Basal Metabolic Rate with Pulse Rate and Pulse Pressure, THE JOURNAL, June 17, 1922, p. 1887.

Read, J. M.: Basal Pulse Rate and Pulse Pressure Changes Accompanying Variations in the Basal Metabolic Rate, *Arch. Int. Med.* **34**: 553 (Oct.) 1924.

Cameron, A. T.; Kitchen, H. D., and McRae, D. F.: Physical Examination and Determination of Basal Metabolic Rates of Group of Young Adults, *Canad. M. A. J.* **16**: 1201 (Oct.) 1926.

Gale, A. M., and Gale, C. H.: Estimation of the Basal Metabolic Rate from Formulae Based on Pulse Rate and Pulse Pressure, *Lancet* **1**: 1287 (June 13) 1931.

TONSILLECTOMY IN PATIENTS WITH PROLONGED COAGULATION TIME

To the Editor:—For several years I have made routine coagulation tests on all patients before performing tonsillectomy, using the open slide method; that is, placing the blood on an open slide and without agitation waiting for a clot to form, considering about eight minutes to be normal time. More and more patients with prolonged coagulation time are coming under my observation. Most of these cases have been brought to normal coagulability by the administration of calcium salts. Within the past six months I have had four cases in which the clotting time ranged from twelve to eighteen minutes, and in three of these I have been unable to reduce the clotting time to anything like normal by any means known to me. I have used calcium lactate, calcium lactate and parathyroid, both orally; parathyroid extract and hemostatic serum hypodermically, but the patients do not respond. Aside from chronically infected tonsils these patients seem perfectly healthy. What is the explanation? Is this condition due to a hemolytic organism, probably from the infected tonsil? What is the best treatment in these cases to render them safe for operation?

F. L. PETERSON, M.D., Chewelah, Wash.

ANSWER.—The coagulation tests used as a routine in most physicians' offices are crude, clinical tests that at best offer only a hint as to possible serious disturbances in coagulation and bleeding times. Because of this, many men practicing otolaryngology have discontinued these tests and rely on a careful history of bleeding in the patient and in the patient's family to guide them. There are tests which are much more accurate and which are described in any good textbook of physiology, but these take time and materials and cannot be practiced in a routine way. In the instances mentioned wherein the coagulation time was apparently prolonged, it is quite possible that there was nothing abnormal present, particularly as the patients appeared well and gave no clue in their histories as to pathologic bleeding. In general it may be said that, in the absence of a clue in the patient's history, the slide method test for coagulability, if prolonged no more than twice or three times the accepted normal time, should be disregarded. In the event

of its being unusually prolonged, the patient should be submitted to a complete physical examination, including that of the blood. Increased coagulation time, when present, rests on a constitutional basis rather than on the presence of hemolytic organisms in the tonsils, as it is well known that these are present in practically 95 per cent of all tonsils, diseased or healthy. A patient who is a pathologic bleeder should not have a tonsillectomy performed unless the indication is urgent, which could not often happen. Should such a state of affairs exist, calcium salts in heavy therapeutic doses, parathyroid extract hypodermically, and hemostatic serums may be used before and after operation.

DISCOLORATION OF SKIN BY GOLD

To the Editor:—Can you give me any information as to the cause and remedy for the discoloration of the skin resulting from the wearing of gold neck chains by women? In some cases it occurs only occasionally, and in others it seems to be constant and a chain freshly cleaned will be tarnished and the skin blackened from only three or four hours' wear. The worst instance I know of occurs in a patient with myxedema who takes thyroid daily. Is this only a coincidence or is there some thyroid relationship with the skin condition? M.D., California.

ANSWER.—The pigmentation of the skin caused by wearing chains of gold alloys, copper and silver is due mainly to the formation of sulphides of those metals.

All proteins, like the body flesh, contain sulphur, about 0.3 per cent. There is a continual breaking down of protein of the body, and of the proteins of the food, with the formation of some sulphides. Traces of these sulphides are excreted in the sweat. If large quantities of sulphur are taken by mouth, the amount of sulphides excreted by the skin may be large enough to impart a disagreeable odor.

When metallic chains are worn round the neck they gradually unite with sulphides and in time become colored dark by sulphides and other substances (oxygen). The rubbing of the chain on the skin causes the skin to become colored. There is rarely any effect on the health of the person, and the objection is for cosmetic reasons.

To prevent this, it is customary to paint such chains with liquid nail polish.

There is no thyroid relationship in this skin condition.

PROGNOSIS AND BLOOD PRESSURE

To the Editor:—Can you give me any statistics or other definite information of assistance in the prognosis of blood pressure? For example, how definitely can one say how long a person with a pressure of 200 systolic will survive, or one with 250, or one with a diastolic of 100 or 120? I realize that many factors enter in, but I am especially interested in the effect such high pressures have on individuals who show no cardiac or renal disease. Please omit name. M.D., Nebraska.

ANSWER.—There are no data available from insurance sources on the prognosis of individuals showing such high pressures, whether systolic or diastolic. Only in exceptional cases is insurance granted to persons with a systolic pressure exceeding 175 or a diastolic pressure exceeding 100. These individuals are selected with great care and, of course, must be free from any cardiac or renal pathologic conditions.

Even in cases of moderately excessive pressures the subsequent mortality is high. Thus, in one study among persons with a systolic pressure 25 mm. or more above average (most cases being less than 45 mm. above average) the mortality is more than twice the normal, and it increases rapidly for higher pressures.

In another study, carefully selected cases with the diastolic pressure from 11 to 21 mm. above the average for the age and the systolic pressure from 16 to 30 mm. above the average gave a subsequent mortality more than one and one-half times the normal. This group contains very few persons whose diastolic pressure exceeded 100.

Insurance experience indicates that the mortality of persons with hypertension in early middle life is relatively higher than the mortality in those past 50.

On the basis of insurance statistics at hand, it is evident that the prognosis in cases of hypertension is poor. The number of years the patient may live depends, among other things, on his age when the hypertension begins. On the average, patients with systolic blood pressure 35 mm. above normal, and a diastolic 20 mm. above normal, may be expected to live about twenty-two years, compared to thirty-one years for unimpaired persons; at age 50, fifteen and one-half years, compared with twenty-two and one-half years for normal persons; and at age 60, nine and one-half years, as against fifteen for the normal. It must be remembered that these figures are averages and, on the whole, optimistic, although the pressures involved are only moderately high.

The indications are that the prognosis is worse in cases showing pressures higher than these, and increasingly so with progressively greater pressures. This is particularly true in the case of the diastolic pressure.

In general, insurance experience confirms the observation recently made by a group of physicians that practicing physicians often remember vividly the patients who have survived many years in spite of hypertension but forget that these cases are the exception rather than the rule (see "Follow-Up Study of Hypertension," by Drs. J. M. Blackford, J. M. Bowers and J. W. Baker, THE JOURNAL, Feb. 1, 1930, p. 328).

TRAUMATIC PERFORATION OF TYMPANIC MEMBRANE

To the Editor:—A man, aged 51, gave a history of a disagreement with another man about a month ago. The other man hit the patient with his fist on the left jaw several times. Two teeth were knocked out. Since then the left ear has begun hurting in the mornings, but at first he did not pay attention to it. Lately he has not been able to hear so well and his left ear hurts more and constantly. On physical examination of the ears it was found that the right ear could hear an ordinary watch tick at a distance of 8 inches. The left ear could hear the watch tick only at a distance of 2 inches, and after a cough at only 1 inch. The right ear drum is normal. The left ear drum has a more or less horizontal position at the upper two thirds and looks shrunken; the umbo is protruding conspicuously. There is a rupture of the membrane close to and below the umbo, about 0.25 to 0.5 cm. This flaps open and closes when he blows on his nose with the mouth closed. There is a pale area around the ruptured membrane and there is an increased number of enlarged blood vessels. The patient was seen more than a month after the accident and there was no sign of bloody discharge at any time except dark brown wax. Is it possible that the ruptured membrane is due to the blows on the jaw or on the side of the face near the ear? Has there been any record of such accidents and are there any medicolegal decisions? What would be the prognosis? The patient is now using ear drops of equal parts of boric acid and alcohol with 8 drops of phenol. What other treatment would be beneficial? Any further suggestions would be appreciated. Please omit name. M.D., Indiana.

ANSWER.—Traumatic perforations of the membrana tympani, as described, are not uncommon. They may be accompanied by some pain, although this is not a pronounced symptom, and they are frequently accompanied by more or less loss of hearing. In most instances and particularly when infection does not supervene, the perforation heals readily and the hearing usually returns to normal. In the instance described, the perforation does not seem to be healing as quickly as might be expected. It may be that it will remain patent and that there will be a more or less permanent loss of hearing. Every attempt should be made to aid healing by keeping water and soap out of the ear, by asking the patient not to blow his nose violently, especially when he has a cold, and by cauterizing the margins of the perforation cautiously with increasing concentrations of trichloracetic acid, beginning with strengths of about 30 to 50 per cent. It is not wise to continue to use ear drops with phenol in them over long period, as phenol ultimately produces a desquamation of the epidermis of the canal. It is perfectly proper, however, to use boric acid and alcohol solutions.

CHEMICAL POISONING FROM FUMES IN DYE INDUSTRY

To the Editor:—Being connected with textile and dyeing work, I would appreciate your comments on whether or not the fumes from the following formula are irritating enough to cause damage to the employees. This dyeing mixture is used in large raw stock machines which hold 800 pounds of cotton with approximately a capacity of 1,200 gallons. In 1,200 gallons of water the following are added:

100 pounds of sodium sulphide
60 pounds of ammonium sulphate
50 pounds of 58 per cent soda ash
200 pounds of common salt
100 pounds of sulphur dyestuff

The temperature of the mixture varies from 100 to 190 F. There are as many as four machines running constantly in one room and I am interested to know whether the fumes from this mixture are irritating enough to cause trouble. E. E. ROBINSON, M.D., Kannapolis, N. C.

ANSWER.—Near the higher temperatures mentioned it is likely that some of the chemicals specified will be carried to the atmosphere in steam. The complete significance of the expression "sulphur dyestuff" is not known, but if no unusual toxicity is ascribed to this, it is believable that the mixed vapors arising limit their damage to irritation of the eyes and respiratory passages. A dermatitis may arise.

Although severe conditions may not be expected to arise from the direct action of these chemicals, it is possible that major disease states, such as pneumonia, may be preceded by trivial chemical irritation.

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Council on Medical Education and Hospitals

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 10. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

AMERICAN BOARD FOR OPHTHALMIC EXAMINATIONS: Milwaukee, June 12. Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: The *written* examination will be given in cities of the United States and Canada where there is a Diplomate who may be empowered to conduct the examination, April 1. The *general oral, clinical and pathological* examination will be held in Milwaukee, June 13. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OTOLARYNGOLOGY: Milwaukee, June 12. Sec., Dr. W. P. Wherry, 1509 Medical Arts Bldg., Omaha.

ARIZONA: Phoenix, Jan. 10-11. Sec., Dr. B. M. Berger, 743 E. McDowell Road., Phoenix.

DISTRICT OF COLUMBIA: Washington, Jan. 9-10. Sec., Dr. W. C. Fowler, 203 District Bldg., Washington.

HAWAII: Honolulu, Jan. 9-12. Sec., Dr. James A. Morgan, Room 48, Young Bldg., Honolulu.

MINNESOTA: Minneapolis, Jan. 17-19. Sec., Dr. E. J. Engberg, 524 Lowry Medical Arts Bldg., St. Paul.

NATIONAL BOARD OF MEDICAL EXAMINERS: The examination will be held in centers where there are five or more candidates, Feb. 13-15. Ex. Sec., Mr. Everett S. Elwood, *225* S. 15th St., Philadelphia.

NEVADA: *Reciprocity.* Carson City, Feb. 6. Sec., Dr. Edward E. Hamer, Carson City.

NEW YORK: Albany, Buffalo, New York, Syracuse, Jan. 30-Feb. 2. Chief, Professional Examinations Bureau, Mr. Herbert J. Hamilton, Room 315, State Education Bldg., Albany.

RHODE ISLAND: Providence, Jan. 5-6. Dir., Dr. Lester A. Round, 319 State Office Bldg., Providence.

SOUTH DAKOTA: Pierre, Jan. 17. Dir., Dr. H. R. Kenaston, Bonesteel.

VERMONT: Burlington, Feb. 15-17. Sec., Dr. W. Scott Nay, Underhill.

WASHINGTON: *Basic Science.* Seattle, Jan. 12-13. *Regular.* Seattle, Jan. 16-17. Dir., Mr. Charles R. Maybury, Olympia.

WISCONSIN: Madison, Jan. 10-12. Sec., Dr. Robert E. Flynn, 315 State Bank Bldg., LaCrosse.

WYOMING: Cheyenne, Feb. 6. Sec., Dr. W. H. Hassel, Capitol Bldg., Cheyenne.

Iowa June Examination

Mr. H. W. Grefe, director, Division of Examinations and Licenses, reports the examination held in Iowa City, June 7-9, 1932. The examination covered 8 subjects and included 100 questions. An average of 75 per cent was required to pass. One hundred and eight candidates were examined, all of whom passed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
University of Colorado School of Medicine		(1930)	88.9*
Yale University School of Medicine		(1929)	88
Northwestern University Medical School		(1932)	90.4
Rush Medical College		(1931) 86.6, (1932)	79.9
State University of Iowa College of Medicine		(1931)	76.9,
(1932)* 81.3, 81.6, 81.9, 81.9, 82, 82, 82.5, 82.8, 83.3, 83.5, 83.5, 83.6, 83.6, 83.8, 83.8, 83.9, 84, 84, 84.3, 84.3, 84.5, 84.5, 84.6, 84.6, 84.8, 84.9, 85.1, 85.3, 85.4, 85.4, 85.4, 85.4, 85.5, 85.5, 85.5, 85.5, 85.6, 85.6, 86, 86.1, 86.1, 86.1, 86.1, 86.3, 86.3, 86.5, 86.5, 86.5, 86.8, 86.8, 86.8, 86.8, 86.8, 86.9, 86.9, 87.1, 87.1, 87.3, 87.4, 87.5, 87.6, 87.6, 87.6, 87.8, 87.9, 88.1, 88.1, 88.1, 88.3, 88.4, 88.5, 88.6, 88.8, 88.8, 88.9, 89, 89, 89, 89, 89.1, 89.1, 89.1, 89.3, 89.3, 89.4, 89.5, 89.8, 89.8, 89.9, 90.1, 90.3, 90.6, 90.6, 91.8, 92, 93.1, 96.9			
University of Minnesota Medical School		(1931)	80.8
Creighton University School of Medicine		(1932)	85.4*
University of Nebraska College of Medicine		(1930)	89.1,
(1932) 81.4*			
University of Buffalo School of Medicine		(1925)	90.3
University of Toronto Faculty of Medicine		(1929)	87.9

* The licenses of these applicants are being withheld pending completion of an internship.

California Reciprocity Report

Dr. Charles B. Pinkham, secretary, California State Board of Medical Examiners, reports 52 physicians licensed by reciprocity with other states and 5 physicians licensed by endorsement from July 21 to Oct. 26, 1932. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
College of Medical Evangelists		(1927)	Maine
Stanford University School of Medicine		(1929)	Penna.
University of Colorado School of Medicine		(1926)	Illinois,
(1928) Colorado			
Northwestern University Medical School		(1909)	Nebraska
Rush Medical College		(1911)	Arizona,
(1926) Minnesota, (1928, 2) Illinois			
University of Illinois College of Medicine		(1923)	Minnesota
State Univ. of Iowa College of Med.		(1927), (1928), (1930)	Iowa
University of Kansas School of Medicine		(1931)	Kansas
University of Louisville School of Medicine		(1930)	Utah
Tulane Univ. of Louisiana School of Med.		(1914), (1930)	Louisiana
University of Maryland School of Medicine and College of Physicians and Surgeons		(1926), (1929)	Maryland
Detroit College of Medicine and Surgery		(1916)	Michigan
University of Michigan Department of Medicine		(1894)	Washington
University of Michigan Medical School		(1927)	Michigan
University of Minnesota Med. School		(1918), (1924), (1929)	Minnesota
Kansas City Medical College, Missouri		(1890)	Missouri,
(1896) Rhode Island			
St. Louis University School of Medicine		(1920)	Missouri
University Medical College of Kansas City, Missouri		(1908)	Kansas
Washington University School of Medicine		(1921)	Missouri
University of Nebraska College of Medicine		(1929)	Nebraska
Columbia University College of Phys. and Surgs.		(1909)	New York
Syracuse University College of Medicine		(1929)	Utah
University and Bellevue Hospital Medical College		(1931)	New York
University of the City of New York Med. Dept.		(1891)	New Jersey,
(1893) New York			
Eclectic Medical College, Ohio		(1923)	Ohio
Ohio State Univ. Coll. of Med.		(1919), (1922), (1926), (1930)	Ohio
University of Oklahoma School of Medicine		(1931, 2)	Oklahoma
University of Oregon Medical School		(1923), (1928)	Oregon
Jefferson Medical College of Philadelphia		(1924)	Penna.
University of Pennsylvania School of Medicine		(1927)	Maryland
Meharry Medical Department of Walden University		(1909)	Georgia
University of Tennessee College of Medicine		(1927)	Arkansas
Wisconsin College of Physicians and Surgeons		(1906)	Wisconsin
University of Manitoba Faculty of Medicine		(1924)	Iowa
University of Edinburgh Faculty of Medicine		(1928)	Minnesota

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Northwestern University Medical School		(1930)	N. B. M. Ex.
Harvard University Medical School		(1927)	N. B. M. Ex.
Jefferson Medical College of Philadelphia		(1924)	N. B. M. Ex.
University of Pennsylvania School of Medicine		(1927)	N. B. M. Ex.
Baylor University College of Medicine		(1920)	N. B. M. Ex.

Ohio Reciprocity Report

Dr. H. M. Platter, secretary, Ohio State Medical Board, reports 29 physicians licensed by reciprocity with other states and 7 physicians licensed by endorsement, Oct. 8, 1932. The following colleges were represented:

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Howard University College of Medicine		(1931)	Maryland,
Emory University School of Medicine		(1929)	Georgia
Rush Medical College		(1925)	Wisconsin, (1932) Illinois
Indiana University School of Medicine		(1931)	Indiana
University of Kansas School of Medicine		(1925)	Missouri
University of Louisville School of Medicine		(1923), (1931)	Kentucky
College of Physicians and Surgeons of Baltimore		(1903)	W. Virginia
Johns Hopkins University School of Medicine		(1927)	Maryland
Univ. of Michigan Med. Sch.		(1924), (1926), (1930), (1931, 2)	Michigan
St. Louis University School of Medicine		(1931, 4)	Missouri
Leonard Medical School, North Caroline		(1911)	W. Virginia
Columbia Univ. College of Physicians and Surgeons		(1930)	New York
Hahnemann Med. College and Hosp. of Philadelphia		(1931)	Penna.
University of Pennsylvania School of Medicine		(1930)	Penna.
Meharry Medical College		(1931)	Tennessee
University of Tennessee College of Medicine		(1931)	Tennessee
Vanderbilt University School of Medicine		(1928)	Tennessee
Marquette University School of Medicine		(1926)	Wisconsin
Magyar Királyi Ferencz József Tudományegyetem Orvostudományi, Szeged		(1919)	New York

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1928)	N. B. M. Ex.
Yale University School of Medicine		(1931)	N. B. M. Ex.
Rush Medical College		(1932)	N. B. M. Ex.
Harvard University Medical School		(1929), (1931)	N. B. M. Ex.
Columbia University College of Phys. and Surgs.		(1925)	N. B. M. Ex.
McGill University Faculty of Medicine		(1930)	N. B. M. Ex.

Hawaii October Report

Dr. James A. Morgan, secretary, Board of Medical Examiners, Territory of Hawaii, reports the written examination held in Honolulu, Oct. 10-13, 1932. The examination covered 10 subjects and included 55 questions. An average of 75 per cent was required to pass. Nine candidates were examined, 8 of whom passed and 1 failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
University of Colorado School of Medicine		(1916)	82.2
Loyola University School of Medicine		(1932)	75.3
Northwestern University Medical School		(1932)	78.7
University of Illinois College of Medicine		(1932)	78.1
Boston University School of Medicine		(1931)	82
St. Louis University School of Medicine		(1931)	79.5
Jefferson Medical College of Philadelphia		(1931)	81.5
Pennsylvania Medical School, China		(1930)	77.7

College	FAILED	Year Grad.	Per Cent
St. Louis Coll. of Physicians and Surgeons, Missouri		(1907)	44.4

Book Notices

Handbook of Bacteriology for Students and Practitioners of Medicine. By Joseph W. Bigger, M.D., Sc.D., F.R.C.P.I., Professor of Bacteriology and Preventive Medicine, University of Dublin. Third edition. Cloth. Price, $5. Pp. 459, with 89 illustrations. Baltimore: William Wood & Company, 1932.

The title of this book well describes its purpose, and the author has bravely carried out his intention to keep the volume small and suitable for the busy medical student. In keeping with this plan, emphasis is successfully put on bacterial description and laboratory technic. Theoretical considerations are abbreviated, consistent with the author's statement in the preface that he "believes it is better to be dogmatic, putting forward a probable theory as the correct one, rather than to leave the student confused with the claims of half a dozen rival theories." Not all instructors will agree with this point of view, and the biologist will not concur in the surprising statement that "the strict pathogens appear to have as their chief function the production of disease in man and animals" (p. 149).

The author has consistently endeavored to bring the book down to the present, with the result that the student or practitioner who seeks a brief, concise statement of the latest views finds it here. Bacterial terminology is of the older type, perhaps with justification in the present confusion of taxonomy; but the student is given the opportunity to learn the newer terms both in a special brief section and in the synonyms in chapter headings. As an introduction to bacteriology, immunology, public health and parasitology, this handbook can be enthusiastically recommended.

Pastoral Psychiatry and Mental Health. By John Rathbone Oliver, M.D., Ph.D., Associate in the History of Medicine at the Johns Hopkins University. The Hale Lectures, 1932. Cloth. Price, $2.75. Pp. 330. New York & London: Charles Scribner's Sons, 1932.

The author of this book states that it is "addressed to clergymen, seminary students and social workers; in fact, to any person without definite medical experience." Because it is not addressed to him it should not deter the physician from reading it. With the exception of the first and last chapters, the book is an excellent popular outline of facts of modern clinical psychiatry. It is not written with the idea of any particular school of therapy in mind and is succinct and interesting. The author is known for his well written novels which have a psychiatric turn. One of these, Victim and Victor, is said to have been considered for the Pulitzer prize. The present book covers the commoner psychoses adequately, giving a pictoral description of each one in such a way that the layman can visualize it. The details are not so full that the reader will be tempted to diagnose any but the most frank cases, and there is supplementary clinical material at the end of each chapter which is graphic and interesting even though not presented in the familiar hospital fashion. With the exception of the description of the psychoses, the strictly medical parts of the book deal chiefly with the neuroses and the sexual basis of mental hygiene. The discussion of the neuroses is largely from the common sense, rather than the classic, point of view. The more modern approach is almost entirely ignored. There are definitions throughout the book which are inaccurate but which would convey to the clergyman a good idea of the meaning of the term defined. Minor definitions and discussions of mental disorders are usually introduced by a more or less lengthy etiologic explanation of the term, and since the book is intended for ministers of the Protestant Episcopal faith, the author permits himself to intersperse a number of Latin phrases throughout the text. There is a chapter devoted to alcoholism and the drug habit in which the discussion about alcoholism is highly theoretical, containing unpractical suggestions. The author minimizes the influence of the drug habit, saying "The whole question of drug addiction in this country has, I believe, been greatly exaggerated." In the light of the fact that the author has been a court psychiatrist, this attitude is of interest.

The treatment of sex in this book is conventional and practical. The author's discussion of masturbation is refreshing and may be of great help in breaking down some of the musty, incorrect ideas which so many of the clergy have. In the case of birth control a distinction is drawn between the use of contraceptives among the unmarried and the legitimate information given at recognized birth control clinics for married women. The first and last chapters will be found of value only to those physicians who are sufficiently interested in religion and its details to be conversant with the points brought out. The first chapter indicates to clergymen of the Anglo-Catholic faith what tools in the way of religious offices are placed at their disposal in the treatment of mental cases. The last chapter deals with the application of spiritual values as therapeutic technics to be used by the clergy. It is largely formalized; and while it does not apply specifically to the author's religious denomination, the information is likely to be of value only to those who are well acquainted with church work or possess the characteristic called "spirituality." The psychiatric information, in spite of some misstatements, is largely correct; and while one may be annoyed at the author when he occasionally writes down to his readers, the book makes, on the whole, easy reading.

Psychiatrists who are practicing in a church clinic or who have patients whose treatment requires the direct religious approach should find this book of great value.

Un pericolo sociale: La brucellosi. Da Prof. A. Alessandrini e M. Pacelli. Con prefazione del Prof. A. Ilvento, vice-direttore generale della Sanità pubblica. Paper. Price, 24 lire. Pp. 184, with illustrations. Rome: Edizioni "Annali d'Igiene," 1932.

In a limited space the authors have succeeded in condensing a formidable array of historical, epidemiologic, bacteriologic and prophylactic knowledge on undulant fever. The style is concise and lucid. Chapter I gives an admirable review of the diffusion of the disease throughout the world and points out the necessity to interest the practitioners in rural communities to be alert for the presence of the disease in their locality. Statistical data are complete and concisely presented. In chapter II the bacteriology of the disease is treated. Excellent methods of differentiation between Brucella melitensis and Brucella abortus are described. The lead sulphide test, positive for abortus and negative for melitensis, is interestingly discussed. The value of the agglutination reactions in diagnosis of the disease is demonstrated as more valuable than differentiating between the two types of Brucella. The variants R and S of Brucella and the parabrucella are fully discussed. In chapter III, every source of contagion is thoroughly discussed. Evidence is presented for the existence of the same type of infectious abortion in man as in animals. Milk, cheese and butter made from infected animals or from animals that are carriers are shown to be a frequent source of infection. Chapters IV to VII treat of prophylaxis. No phase is neglected, and practical methods of hygienic control of sheep, goats and cows are suggested. Sterilization of infected water supplies, the preparation of vaccines, methods of preventive inoculation and results obtained are clearly and concisely related. The sterilization of garden products is described in conjunction with the pasteurization of milk. The problem of undulant fever and epizootic abortion is considered also from the standpoint of the hygienist and the legislator and in its diagnostic and therapeutic aspects. The bibliography contains references to almost every contribution of value on this important subject.

Professional Problems: A Text-Book for Nurses. By Sister John Gabriel, R.N., A.B., Educational Director for Schools of Nursing, Sisters of Charity of Providence in the Northwest. Cloth. Price, $1.75. Pp. 158. Philadelphia & London: W. B. Saunders Company, 1932.

Sister John Gabriel says: "The purpose of this book is not to serve as a textbook in ethics—its principal aim is to bring before the student nurse some of the problems encountered by nurses in the practice of their profession." Concrete situations and problems are helpfully discussed arising in the experience of the institutional nurse, the private duty nurse, the public health nurse and the student nurse. This is a valuable contribution as supplementary reading in the study of ethics and should prove most practical also in offering material for valuable class discussions. It is stimulating and suggestive and will aid in clear thinking concerning standards of professional conduct which, as in all human relations, should be based on the golden rule.

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Your Teeth: Their Care and Preservation. By Lewis H. Urling, D.D.S. Cloth. Price, $1.50. Pp. 67. Philadelphia: Dorrance & Company, Inc., 1932.

In this booklet, dedicated to "mothers and mothers-to-be of today and their children who are to become parents of tomorrow," Dr. Urling has presented much valuable information. The story is told in an interesting and instructive manner and answers many questions regularly asked by patients of their dentists. The chapter to expectant mothers is especially good, but it is difficult to say which chapter contains the most valuable information for the reader. The diet suggestions are practical and will be helpful in the home. Those who read the book will want to keep it for reference and guidance and will be greatly benefited in the daily routine of life. It is a valuable contribution for daily health instruction to people in every walk of life.

Massage and Therapeutic Exercise. By Mary McMillan, Assistant at Sir Robert Jones' Clinic, Southern Hospital, Liverpool. Third edition. Cloth. Price, $2.75. Pp. 359, with 124 illustrations. Philadelphia & London: W. B. Saunders Company, 1932.

A perusal of the title page indicates the excellent qualifications and training of the author. It should excite the envy of any physical therapist. That this is the third edition is additional proof of the value of the book. The author has incorporated some of the more recent theories regarding lateral curvature of the spine and the newer forms of treatment for this condition. The chapter on arthritis has been rewritten. She has simplified the material on the subject of movements of the joints. New illustrations of exercises and revised illustrations on arthritis have been added to the text. The book is equally divided between the subjects of massage and of therapeutic exercise. The author's eight statements concerning the physiologic objects and her six golden rules for massage are well worth reading. On page 102 the author describes sciatic stretching, and figure 32 illustrates "stretching of the sciatic nerve." It is improbable that this maneuver stretches the sciatic nerve, but its chief value lies in the fact that it stretches and tears adhesions chiefly of the hamstring structures. This book should be of real value to the general practitioner and the physical therapist.

Pathologie und pathologische Morphologie der Hypophyse des Menschen. Von Prof. Dr. Walther Berblinger, Direktor des Pathologischen Instituts der Universität Jena. Sonderdruck aus Band I [Lfg. 6] des "Handbuch der inneren Sekretion." Herausgegeben von Dr. Max Hirsch. Paper. Price, 28 marks. Pp. 910-1097, with 86 illustrations. Leipzig: Curt Kabitzsch, 1932.

To students of the internal glandular mechanism who are particularly interested in the problems of the pituitary gland —acromegaly, gigantism, adiposogenital dystrophy, Simmonds' disease, ovarian control, dwarfism — and in the correlative changes in the hypophysis in such conditions as pregnancy, eunuchism, dysthyroidism, parathyroid insufficiency, suprarenal insufficiency, diabetes mellitus, carcinoma and sarcoma, one could recommend no better compendium than this volume. The author presents his views on the pathology and morphology of these various states, together with the current literature that bears on the same problems, his criticisms, and a marshaling of the facts to support his contentions, in such a way as to enlist the interest and sympathetic attention of the reader from the first. Although the title would hardly suggest it, the book teems with the symptomatology of the different syndromes, correlated with changes in their morphology, all analyzed to a nicety; and with a broad understanding of the views of those investigators who disagree with him, the author says: "Whoever knows, even partially, the almost impossibly immense literature of the hypophysis and the contradictions therein, will understand that at times I did not feel able to express myself definitely on some particular phases of the problems." He endeavors to coordinate and clarify changes in function due to structural alterations in the glandular cell elements of the hypophysis; that is to say, his important point of view is that of the relativity of "form and function." One might object to the author's concept of gigantism or its relationship to acromegaly or to his explanation of the few cases of acromegaly reported with no apparent sellar changes; or, on the other hand, to the omission—highly important it seems to us —of the pathologic morphology of the hypophysis in cases of subinvoluted thymus gland, especially in view of studies showing that the thymus controls in a measure the calcium accretion of the bony skeleton and hence must be a great factor in growth. But it is refreshing to be stimulated by occasional adverse views, especially when so well presented as are Professor Berblinger's. The book is a mine of information and has an excellent bibliography.

Cerebral Injury in New-Born Children Consequent on Birth Trauma: with an Inquiry into the Normal and Pathological Anatomy of the Neuroglia. By Erik Rydberg. Acta pathologica et microbiologica Scandinavica, Supplementum X. Paper. Pp. 247, with 49 illustrations. Copenhagen: Levin & Munksgaard, 1932.

This is a supplement to *Acta pathologica et microbiologica Scandinavica*. It is written in English and is based on work done at the South Stockholm Lying-In Hospital and the pathologic department of the Sabbatsberg Hospital in Stockholm. Fifty cases were studied, sixteen with necropsy and elaborate histologic examination of the brain. Fifty pages, with most of the illustrations, many in color, are devoted to a valuable consideration of the peculiarities of the glia of the new-born and its reactions to acute brain injuries. Then follows a chapter on the mechanism of birth injuries. The remainder of the book is devoted to the clinical and anatomic features of the material studied. In the chapter on treatment the author favors blood transfusion, while he warns against the routine use of lumbar puncture and finds few indications for surgical procedures. Pediatricians, neurologists, pathologists and surgeons alike will find this monograph helpful in their work.

A Reference Hand-Book for Nurses. By Amanda K. Beck, R.N. Seventh edition. Fabrikoid. Price, $1.50. Pp. 354, with illustrations. Philadelphia & London: W. B. Saunders Company, 1932.

This book has met a real need and a constant demand over a period of nearly thirty years. It has been reprinted and revised many times. The contents are numerous and varied, embracing such subjects as abbreviations; weights and measures; tables for percentage of solutions; action, uses and doses of the most important drugs; poisons and antidotes; miscellaneous formulas; urinalysis; baths, packs, sweats; chest applications; the preparation of foods; care of children; nursing in acute fevers; obstetrics; psychiatry, and emergencies. A few typographic errors have been overlooked; for instance, the initial dosage of diphtheria antitoxin is given as 3,000 units instead of 30,000. The abandonment of the air borne theory of the transfer of acute communicable diseases has changed the older ideas concerning the management of these diseases. Wet sheets hung over doorways and fumigation of rooms are spectacular but give a false sense of security, whereas more emphasis should be placed on scrupulous cleanliness of the hands of attendants and boiling and burning things contaminated by fresh, moist discharges. On the whole, however, in spite of certain minor deviations from present standards, this little book is helpful and valuable. It can be slipped into a pocket or a small space and has proved a blessing to thousands of busy nurses and will be welcomed by thousands to come.

Varicose Veins and Hæmorrhoids and Their Treatment. By V. Meisen, M.D. With a preface by Aug. Krogh, Ph.D. [Translated from the Danish by Hans Andersen, M.D.] Paper. Pp. 149, with 33 illustrations. Copenhagen: Levin & Munksgaard; London: Oxford University Press, 1932.

This is a sane and conservative exposition of the injection treatment of varicose veins and hemorrhoids. The author describes the technic, complications, indications and recurrences. The work is an enlargement of his articles in the *Acta chirurgica Scandinavica*, which appeared in 1925 and 1927 and which stimulated many workers in English-speaking countries to study and apply this form of treatment. More than half of the book is devoted to the anatomy and physiology of varicose veins and to the functional and structural changes that result from chronic venous stasis. The monograph can hardly be called a textbook. It merely relates the author's personal experience in an informal direct manner. One almost feels as if he were sitting across the table from this genial Scandinavian host, who gives so freely from his vast knowledge of the subject, gained from experience with 3,500 patients. The printing and illustrations, particularly the colored plates, are excellent. The English translation sounds often foreign, sometimes confusing.

Medicolegal

Defective Hospital Equipment—Liability of Special Nurse

(Ratliffe v. Wesley Hospital and Nurses' Training School (Kan.), 10 P. (2d) 859)

The plaintiff was operated on at the Wesley Hospital and Nurses' Training School, a charitable hospital. After the operation, she was returned unconscious to her room. There a special nurse, employed by the plaintiff, prepared to administer a proctoclysis but the string holding the vessel of hot water broke and the plaintiff was severely scalded. She sued the hospital and the special nurse. The trial court sustained a demurrer to the evidence, interposed by the defendants, holding that the hospital was a charitable institution and not therefore liable, and that the evidence did not show negligence on the part of the special nurse. The plaintiff then appealed to the Supreme Court of Kansas.

Even though a charitable institution, contended the plaintiff, organized and maintained for the purpose of ministering to the indigent sick and wounded, is not ordinarily liable for the negligence of its physicians, attendants and employees resulting in injury to its patients, the defendant hospital is here liable because it failed to exercise reasonable care in the selection and employment of its nurses and attendants. To support this contention, the plaintiff alleged that the superintendent of the hospital had no medical training of any kind prior to his appointment as superintendent. But, said the Supreme Court of Kansas, there is no evidence that the superintendent had anything to do with the care of patients or the preparation of the equipment. He was the executive head of the hospital and as such had general supervision of the institution. Experienced graduate nurses had direct supervision of the student nurses, and the equipment of the hospital was standard equipment of the kind usually found in such institutions. No lack of due care, concluded the court, on the part of the hospital in the employment of its agents and servants was shown.

The question of the liability of the special nurse, the Supreme Court admitted, is more difficult to determine. The special nurse was the employee of the plaintiff and acted under the orders of the plaintiff's physician in the use of the facilities furnished by the hospital. She had nothing to do with the selection of the equipment. The room to be occupied by the plaintiff was arranged and equipped while the operation, in which the special nurse assisted, was being performed. She returned to the room with the patient and found it equipped with a proctoclysis set, which stood at the foot of the bed. The water container was fastened to the pole with a gauze string. This appears to be a common practice and could not under the circumstances of this case have been a patent defect of which the nurse was bound to take notice. The special nurse moved the proctoclysis set to the side of the bed about even with the patient's hip. There was no evidence tending to show that this was not a proper thing to do. While the nurse was taking the pulse of the patient, the string broke, and the water spilled in the bed and scalded the patient. The plaintiff insisted that the doctrine of res ipsa loquitur applies here and that the trial court was bound to presume from the facts stated that the special nurse was negligent. The doctrine of res ipsa loquitur, said the Supreme Court, is not evidence of negligence and rests essentially on the absence of direct evidence of the defendant's negligence. The inference arising under the doctrine is overcome when there is evidence of specific acts of negligence, and has no force in the presence of direct evidence. 45 C. J. 1199, 1206.

The plaintiff contended that the evidence warrants the conclusion that the hospital furnished defective and worn out equipment and that the nurse was negligent in not examining the equipment to be used by her in caring for the plaintiff. The accident, said the court, happened because of the failure of the equipment furnished by the hospital to sustain the water container. The hospital was of the plaintiff's own choosing. The nurse was the employee of the plaintiff to use the facilities and equipment furnished by the hospital. She had the right to believe and act on the assumption that the equipment was safe and adequate to perform the service for which it was intended. It was not her duty to examine into the intricate parts of the equipment for latent defects. Under the evidence here presented, the nurse was not guilty of negligence. The judgment of the trial court for the defendants was sustained.

Workmen's Compensation Acts: Traumatic Appendicitis.—In the course of her employment, the claimant fell, striking her right side on a table, "thereby necessitating the removal of her appendix four days thereafter." In an action by the claimant to recover compensation under the workmen's compensation act, the physician who removed the appendix testified that in his opinion the claimant may have had a diseased appendix prior to the fall and that the fall had caused the condition to "flare up" or "light up." Another physician, who was present during the operation, testified that the injury received by the claimant aggravated her condition and caused an attack of subacute appendicitis. Two physicians, called by the employer, testified that they had never seen a case of traumatic appendicitis and that there was nothing in the evidence to indicate that the claimant had suffered traumatic appendicitis. The claimant was awarded compensation and the employer eventually appealed to the Supreme Court of Nebraska. While, said the court, there appears to be a lack of entire harmony among medical authorities as to the possibility of appendicitis being caused by trauma, nevertheless a review of the legal authorities indicates that injuries resulting in the removal of an appendix in the injured person are compensable under the provisions of the workmen's compensation act. Testimony of a physician based on observation and examination of a patient and on the history of the case related by the patient is admissible in evidence. The Supreme Court of Nebraska affirmed the award in favor of the claimant.—*Watkins v. Brunswick Restaurant (Neb.), 242 N. W. 439.*

Workmen's Compensation Acts: Compensability of Hernia.—The New Jersey workmen's compensation act (P. L. 1923, p. 104, sec. 11) provides that an employee to receive compensation for an industrial hernia must offer conclusive proof that the descent of the hernia "immediately followed the cause." The claimant, Borodaeff, "hurt himself in the side" while lifting a 40-quart can of milk. He had to stop work immediately and was sent to a physician. The next morning a lump appeared in his abdomen, which was diagnosed as a right inguinal hernia. The workmen's compensation bureau refused compensation, holding that the descent of the hernia did not *immediately* follow the cause. Considering the provisions of the workmen's compensation act, said the supreme court of New Jersey, the phrase *"immediately followed the cause"* should not be construed to mean "instantly followed the strain." Probably in most such cases there is some appreciable lapse of time between the cause and the descent. No doubt the word "immediately" is sometimes used in the sense of "instantly," but that is by no means its only meaning. The phrase *"immediately followed the cause"* should be held to mean "soon enough and in such manner as to make it appear clear that the descent was the effect of the strain and pain complained of which forced cessation of work." This is apparent when the additional requirements of the statute are considered that the pain and prostration "were of such severity that the same was noticed by the claimant and communicated to the employer within twenty-four hours after the occurrence of the hernia." The real purpose of the precaution laid down in the statute is to protect the employer from claims for hernia not actually caused by accident. Under the evidence presented, the claimant is entitled to compensation.—*Borodaeff v. Province Line Dairy (N. J.), 160 A. 513.*

Society Proceedings

COMING MEETINGS

American College of Physicians, Montreal, February 6-10. Mr. E. R. Loveland, 133-135 South 36th Street, Philadelphia, Executive Secretary.

Annual Congress on Medical Education, Medical Licensure and Hospitals, Chicago, February 13-14. Dr. W. D. Cutter, Council on Medical Education and Hospitals, 535 North Dearborn St., Chicago, Secretary.

Clinical Orthopedic Society, Chicago, January 12-14. Dr. E. B. Mumford, Chamber of Commerce Building, Indianapolis, Secretary.

Pacific Coast Surgical Association, Del Monte, Calif., February 24-26. Dr. Edgar L. Gilcreest, 384 Post Street, San Francisco, Secretary.

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Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Clinical Pathology, Baltimore

2: 361-435 (Sept.) 1932

Prospect and Retrospect. H. J. Corper, Denver.—p. 361.

Demonstration of Mycobacterium Tuberculosis in Exudates, Tissues and Body Fluids: Concerning Guinea-Pig Inoculation and Cultural Method for Demonstration of Mycobacterium Tuberculosis. W. W. Herrmann, G. H. Hansmann and Thelma DeCapito, Iowa City.—p. 371.

Chemical and Bacteriologic Studies of Pyridium. A. Goerner and F. L. Haley, Brooklyn.—p. 379.

Experimental Study of Action of Phenylhydrazine Hydrochloride and Acetylphenylhydrazine (Pyrodin), with Reference to Their Use in Treatment of Polycythemia Vera. M. Bodansky, W. L. Marr and P. Brindley, Galveston, Texas.—p. 391.

Chart and System for Reporting and Recording Blood Examinations. F. Boerner.—p. 403.

Photo-Electric Scopometer. W. G. Exton, New York.—p. 411.

American Journal of Diseases of Children, Chicago

44: 701-920 (Oct.) 1932

Diameter of Red Blood Cells of Premature Infants and of Those Born at Full Term. S. van Creveld, Amsterdam, Holland.—p. 701.

Congenital Syphilis: Results of Early Treatment. E. D. Atlee and R. M. Tyson, Philadelphia.—p. 718.

*Effect of Tonsillectomy and Adenoidectomy on Reaction to Schick Test (Diphtheria Immunity). J. A. Bigler, Chicago.—p. 728.

Insensible Perspiration in Infancy and in Childhood: IV. Basal Measurements in Dehydrated Infants. S. Z. Levine, New York, and T. C. Wyatt, Syracuse, N. Y.—p. 732.

Aspiration in Treatment of Empyema in Children, with Critical Evaluation Based on Ninety-Four Cases. E. T. McEnery and J. Brennemann, Chicago.—p. 742.

*Tuberculous Pulmonary Infiltrations in Childhood. Ann Martin, Oakland, Calif.—p. 754.

Apparatus for Quantitative Collection of Urine and of Stools in Male Infants. Lynne A. Hoag, New York.—p. 770.

*Dyschondroplasia Foetalis. H. L. Dwyer, Kansas City, Mo.—p. 776.

Diphtheria Immunity.—Bigler tested 470 children before tonsillectomy, of whom 69 per cent gave positive reactions to Schick tests and 31 per cent gave negative reactions. The author concludes that although this was a study of children from a crowded, urban community and wholly of charity patients, the following conclusions seem warranted as regards this particular series: 1. Tonsillectomy and adenoidectomy had very little influence toward changing a positive Schick reaction to a negative one at the end of from six to nine months after operation. 2. The small amount of toxin in the Schick test had little influence on the development of humoral immunity to diphtheria as measured by the Schick test over a period of from six to nine months after tonsillectomy. 3. It would seem that the decreased incidence of diphtheria after tonsillectomy and adenoidectomy is not due to increased humoral immunity to diphtheria as measured by the Schick test but may be due to the removal of a portal of entry or of a fertile soil for the growth of the diphtheria bacilli.

Tuberculous Pulmonary Infiltrations in Childhood.—Martin reports sixty cases of tuberculous pulmonary infiltration, which she divided into three clinical groups according to their symptom complex: children with acute tuberculous pneumonia, children who were not well but who showed no evidence of an acute illness, and children in good health. In her series 80 per cent of the cases with pulmonary infiltrations occurred in children under 6 years of age. Tuberculous infiltrations in the lungs are characterized by their chronicity, as demonstrated by serial roentgenograms. In this respect they can usually be differentiated from the nontuberculous infiltrations. Serial roentgenograms are absolutely necessary in the study and care of juvenile tuberculosis. Physical signs, except in the acute stage of tuberculous bronchopneumonias, are of little help in determining the presence of a tuberculous infiltration in the lungs of children. All the children with pulmonary infiltrations had positive intradermal reactions. A history of contact was present in 65 per cent of the cases. Chronic infections of the upper respiratory tract were present in a large number of the cases. A tonsillectomy was indicated in selected cases. Acute tuberculous pneumonias are more frequent than is generally recognized. They have a good prognosis if seen early and if repeated infection is prevented by separating the child from the source of infection.

Dyschondroplasia Foetalis.—Dwyer presents a study of three children from one family, a boy, aged 11, and two girls, aged 10 and 15, who presented an unusual condition of the epiphyseal cartilages, associated with certain characteristic deformities of Ollier's dyschondroplasia. The lesions consisted of incomplete calcification of the epiphyses, most marked in the heads of the femurs and the acetabulums. The ends of the other long bones were similarly involved. The principal deformities were caused by a shortening of the ulna and bowing of the radius in one arm of each of the girls, pes valgus of extreme degree from shortening of the fibula, and angulation at the knee joint from small irregular epiphyseal plates at the distal end of the femurs. The cases showed no exostoses and but slight involvement of the metaphyses, thereby differing from the usual picture of chondrodysplasia (multiple exostoses) or dyschondroplasia (Ollier's disease). They are compared with typical cases of multiple exostoses and chondrodystrophia foetalis. The widened metacarpal epiphyses, the short stature and the trident hand of one girl resembled chondrodystrophia foetalis. However, the deformity of the forearm in two of these children and rarefaction of the iliac crest are classic deformities of the condition described as dyschondroplasia, and the condition presented in these children is regarded as an unusual form of this disease, unusual because of rarefaction of the epiphyses. Studies of the calcium and phosphorus metabolism in these children while on a low calcium diet showed slight negative balances comparable to those found in normal persons. The condition is interpreted as an incomplete calcification of the epiphyses of growing bone rather than as a loss of mineral substances from the bone.

American Journal of Orthopsychiatry, Menasha, Wis.

2: 315-423 (Oct.) 1932

Contributions of Psychology to Understanding of Problems of Personality and Behavior: I. Modern Fields and Schools of Psychology, What They Offer at Present and What They Promise for Future for the Study of Personality and Conduct Problems. G. Murphy.—p. 315.

Id.: II. Evaluation of Personality and Character Tests. F. L. Wells, Boston.—p. 327.

Id.: III. Developmental Norms, Individual Differences and Learning. W. C. Olson.—p. 335.

Id.: IV. Biologic Foundation of Personality Differences. C. P. Richter. —p. 345.

Stuttering: Its Neurophysiologic Basis and Probable Causation. F. W. Brown, New York.—p. 363.

Family Attitudes as Revealed by Psychiatric Examinations of One Hundred and Seven Juvenile Delinquents. H. W. Newell, Cleveland. —p. 377.

Personification of Ideals and Stereotypes in Problem Children. H. Meltzer, St. Louis.—p. 384.

Supplying Psychiatric Needs of Pediatric Clinic. L. Kanner, Baltimore. —p. 400.

American Journal of Physiology, Baltimore

101: 573-733 (Sept. 1) 1932

Prevention of Hypertrophy and Limitation of Normal Pulsation and Expansion of Kidney by Means of Casts. S. Soskin and O. Saphir, Chicago.—p. 573.

Physiologic Activity of Iodine in Thyroglobulin. B. O. Barnes.—p. 583.

Manganese as Factor in Reproduction. J. T. Skinner, Evelyn van Donk and H. Steenbock.—p. 591.

Effect of Experimental Hyperthyroidism on Gastro-Intestinal Motility: I. Dorothy Fetter and A. J. Carlson.—p. 598.

Effect of Induced Hyperthyroidism on Gastro-Intestinal Motility of Vagotomized Dogs: II. Dorothy Fetter, L. Barron and A. J. Carlson. —p. 605.

Factors Which Influence Flow and Protein Content of Subcutaneous Lymph in Dog: II. Effect of Certain Substances Which Alter Capillary Circulation. Florence W. Haynes.—p. 612.

Glycogenesis in Totally Phlorhizinized Organism. S. G. Major, Rochester, Minn.—p. 621.

Excretion of Urine in Dog: IV. Effect of Maintenance Diet, Feeding, and so Forth, on Quantity of Glomerular Filtrate. J. A. Shannon, N. Jolliffe and H. W. Smith, New York.—p. 625.

Id.: V. Effects of Xylose and Sucrose on Glomerular and Urea Clearances. N. Jolliffe, J. A. Shannon and H. W. Smith, New York.—p. 639.

Chemical Control of Breathing, as Shown in Acid Base Balance of Blood, Under Progressive Decrease of Oxygen. Y. Henderson and Ellen M. Radloff.—p. 647.
Studies on Suprarenal Insufficiency: XI. Growth of Transplanted Cortical Tissue in Rat. L. C. Wyman and Caroline Tum Suden.—p. 662.
Cerebrospinal Elasticity in Cat and Macaque. L. H. Weed and L. B. Flexner, Baltimore.—p. 668.
Action Potentials from Single Muscle Fibers. S. Gelfan and G. H. Bishop.—p. 678.
Blue Excitation Curve of Dichromats. E. Freeman and W. F. Hamilton.—p. 686.
Catalepsy Caused by Lesions Between Mammillary Bodies and Third Nerve in Cat. S. W. Ranson and W. R. Ingram, Chicago.—p. 690.
Rate of Formation of Cerebrospinal Fluid in Etherized Cats. L. B. Flexner and H. Winters, Baltimore.—p. 697.
Effect of Posterior Pituitary Extracts on Constituents of Blood. H. E. Himwich, F. W. Haynes and J. F. Fazikas, New Haven, Conn.—p. 711.

Annals of Internal Medicine, Ann Arbor, Mich.

6: 457-594 (Oct.) 1932

*Artificial Fever Produced by Short Wave Radio and Its Therapeutic Application. C. F. Tenney, New York.—p. 457.
Comparison of Orthodiagraphic and Teleroentgenographic Measurements of Heart and Thorax. P. D. White and P. D. Camp, Boston.—p. 469.
*New Percussion Technic. F. Smithies, Chicago.—p. 482.
Further Observations on Primary Carcinoma of Liver in Chinese. G. F. Strong and H. H. Pitts, Vancouver, B. C., Canada.—p. 485.
*Some Recent Observations Regarding the Nature of Epilepsy. Irvine McQuarrie, Minneapolis.—p. 497.
Modern Muscle Physiology and Circulatory Failure. J. C. Meakins, Montreal, Canada.—p. 506.
Fatal Cinchophen Poisoning: Report of Six Cases. L. Parsons and W. G. Harding 2d, Los Angeles.—p. 514.
Agranulocytic Angina: Report of Case, with Bacteriologic Study. A. E. Greer, Houston, Texas.—p. 518.
Typhus-Spotted Fever Group. N. Toomey, Palmyra, Mo.—p. 542.
The Modern Hospital: Its Relationship to Physician. B. W. Black, Oakland, Calif.—p. 563.
Antony van Leeuwenhoek, 1632-1723. C. V. Weller, Ann Arbor, Mich.—p. 573.

Artificial Fever.—Tenney thinks, as Pemberton does, that arthritis is in part a disease of the circulation and that any one of several infective agents may be the causative factor in many of the cases. Heat in almost any form is excellent. If a patient is undergoing a course of vaccine therapy under the direction of his physician and is referred to him for radiothermy, the vaccine is continued. The greater number of his cases have been treated with radiothermy and massage, with the preliminary step of removal of foci of infection. In his use of the high frequency heater in the treatment of syphilis he has treated primary, secondary and tertiary cases in conjunction with the regular antisyphilitic treatments. The results of the treatment in the primary and secondary cases have been good; the primary lesion and secondary rash disappeared with unusual rapidity. In some of the cases that presented a strongly positive Wassermann reaction, after one treatment the reaction has been returned as weakly positive. His best results have been obtained in the tertiary cases, especially in those involving the central nervous system. If a temperature of 106 F. is maintained from two to four hours in cases of gonorrheal infection, such as urethritis, and in pelvic inflammatory disease, it acts almost as a specific. As the thermal death point of the gonococci is supposed to be around 104 F., they are probably destroyed by the heat. In diseases of the circulation of the lower extremities, he has used both general and local forms of therapy. In the few cases of intermittent claudication of the arteriosclerotic type that he has treated, there was improvement; pain came on later in exercise, and there was an increase in the arc of the oscillometer readings. In thromboangiitis obliterans in younger persons he has not had sufficient time or cases to draw definite conclusions. In three cases of Raynaud's disease treated, the results compare favorably with those of foreign protein injections.

New Percussion Technic.—Smithies describes a percussion technic that he has used for thirteen years. The technic is as follows: The plexímeter finger is placed on the thorax or whatever body section is to be percussed, in the usual manner. The plexímeter finger is pressed firmly or lightly on the body wall, according to whether superficial or deep percussion is desired. The striking "hammer" is arranged by crossing the flexor surface of that portion of the second finger beyond the last interphalangeal joint of the percussing hand over the extensor surface of the index finger of the same hand, so as to have it cover practically the whole nail surface and that part of the index finger distal to the last interphalangeal joint. Then by a quick, snapping movement the second finger is slid from the index finger so as to strike forcibly the extensor surface of the "plexímeter" finger of the other hand. The author believes that the advantages of this technic are the avoidance of fingers made painful by trauma and cramp in long continued work, unsightly, close-cut nails on "hammer" fingers, clearer percussion tone, and the ease with which this may be modified in volume and amplitude, rapid comparisons or contrasts in percussion tones in the several sections of a part being examined, e. g., the thorax, when teaching or demonstrating in class work, the quick and easy demonstration of percussion anomalies, and greater percussion accuracy.

Nature of Epilepsy.—McQuarrie reviews experimental and clinical studies on the relationship of epileptic seizures to variations in the water and mineral exchanges of the body. Production of a deficit in the body water by any means tends to cause a temporary cessation of convulsions in severely epileptic children. Reestablishment of a positive water balance results in recurrence of seizures in such patients. Typical grand mal attacks can be induced in a high percentage of the mildly epileptic patients, but not in nonepileptic patients, by giving water at the rate of from 2 to 5 cc. per kilogram of body weight per hour while maintaining effective pituitary antidiuresis. Dilution of the extracellular body fluids is considered to be essential to the induction of seizures under these conditions, because addition to the low mineral diet of sufficient sodium chloride to prevent dilution tends to prevent their occurrence. Mineral studies show that during periods of diuresis and freedom from seizures the excretion of sodium and chloride greatly exceeds that of potassium. In one series of experiments it was found that the potassium balance was strongly negative during convulsive periods, when water was being stored. At the same time sodium chloride showed a slightly positive balance. Since most of the potassium of the human body is held within the cells, this marked increase in potassium excretion, which manifested itself in a case of severe epilepsy from two to thirty-six hours before convulsions began to occur, indicated a "leakage" through the cell membrane. This phenomenon has not been found to occur in normal subjects under similar conditions.

Archives of Internal Medicine, Chicago

50: 511-648 (Oct.) 1932

Insulin Dosage and Blood Sugar Changes. E. L. Scott and L. B. Dotti, New York.—p. 511.
*Pernicious Anemia: Treatment with Equine Liver Extract Injectable Either Subcutaneously or Intravenously. A. E. Meyer, O. Richter and A. C. Ivy, Chicago.—p. 538.
Urea Clearance Test as Index of Renal Function: III. Studies of Patients with Bright's Disease. M. Bruger and H. O. Mosenthal, New York.—p. 544.
Id.: IV. Urea Clearance Test in Relation to Other Tests and Measures of Renal Function. M. Bruger and H. O. Mosenthal, New York.—p. 556.
*Sedimentation Test as Routine Laboratory Procedure: Observations on Eleven Persons. H. J. Schattenberg, New Orleans.—p. 569.
*Methemoglobinemia. W. J. Dieckmann, Chicago.—p. 574.
*Method for Simultaneous Enumeration of Blood Platelets and Reticulocytes, with Consideration of Normal Blood Platelet Count in Men and Women. W. Dameshek, Boston.—p. 579.
Kidney Weight, Body Size and Renal Function. E. M. MacKay, La Jolla, Calif.—p. 590.
*Nontropical Sprue with Duodenal Involvement and Tetany. R. B. Radl and Madeleine Fallon, Minneapolis.—p. 595.
Experimental Studies in Gastric Physiology: Evaluation of Rôle of Duodenal Regurgitation in Control of Gastric Acidity in Man (Boldyreff Theory). H. Shay, A. B. Katz and E. M. Schloss, Philadelphia.—p. 605.
*Intrinsic Gastroduodenal Lesions as Causative Factors of Hematemesis. A. B. Rivers and D. L. Wilbur, Rochester, Minn.—p. 621.
Sickle Cell Anemia: Report of Case. G. M. Brandau, Houston, Texas.—p. 635.

Pernicious Anemia.—Meyer and his associates found that an injectable equine liver extract was capable of producing a complete remission in thirteen cases of pernicious anemia within from six to eight weeks. This extract was found to be comparatively painless on subcutaneous administration and was safe when the precautions indicated for intravenous use were observed. Patients do not object to this painless injection. Patients on maintenance, returning to the authors' clinic, receive injections at intervals and are not subjected to dietary require-

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ments. For maintenance use, the interval between injections varies with different patients and with complications that may arise from time to time in the same patient. For this reason they insist that all patients return to the clinic periodically for a complete blood count to establish the individual intervals of dosage.

Sedimentation Test as Routine Laboratory Procedure.—Schattenberg states that a standard technic for the performance of the sedimentation test should be accepted. That of Cutler is the most applicable, since it gives one the benefit of the first hour's readings, which are the most important, at ten minute intervals. Furthermore, the observer's time is taken up for a period of one hour only. A normal sedimentation rate with but few exceptions rules out the presence of disease. Since there is a physiologic increase in fibrinogen during menstruation and pregnancy, one naturally expects a rapid sedimentation of the red blood cells. The sedimentation test is useful in the differential diagnosis of gynecologic conditions. It is useful in determining the proper time for nonurgent elective operations, in prognosticating postoperative complications after the first week, and as a criterion for discharging patients. In active tuberculosis, the sedimentation rate is always rapid, regardless of physical observations; it is also of more value than are the pulse rate, temperature and weight in checking treatment in a tuberculous patient. In health departments, it assists in the diagnosis of obscure diseases that would otherwise escape detection. Accelerated sedimentation means destruction of tissue, and the examiner therefore reexamines the patient to ascertain the nature of the pathologic process that was overlooked the first time.

Methemoglobinemia.—A case of cyanosis due to methemoglobin of unknown origin, which had been present for twenty-seven years, is reported by Dieckmann. The accidental discovery in a routine examination warrants the statement that the condition would be detected more frequently if the blood of cyanotic patients was examined spectroscopically. More attention should be given to the determination of the oxygen capacity of the blood than to the colorimetric determination of hemoglobin. In the normal person, the results are identical, but in certain pathologic conditions the apparent hemoglobin may be within normal limits and yet the patient be suffering from anemia because a portion of the hemoglobin cannot carry oxygen.

Platelet and Reticulocyte Count.—Dameshek describes an indirect method for the simultaneous enumeration of the blood platelets and reticulocytes which depends on the use of an isotonic, anticoagulating solution containing the "vital" dye brilliant cresyl blue. The platelets are examined under the oil immersion lens. Reticulocytes are well stained and are counted simultaneously with the platelets. The author's method has the following advantages: 1. It is simple. 2. It is accurate. 3. It permits accurate recognition of individual platelets and reticulocytes and study of their morphologic aspects. 4. It combines in one preparation two hematologic methods: platelet and reticulocyte counting. Normally, there is slight variation in the size and shape of the blood platelets. The normal blood platelet count with this method in men ranges from 500,000 to 900,000 per cubic millimeter. The normal count in women is made uncertain by the complicating presence of the menstrual cycle. The intermenstrual range is from 400,000 to 800,000 per cubic millimeter. Various procedures to check the accuracy of the method were undertaken. The experimental error is probably not greater than 70,000 per cubic millimeter when the erythrocyte count is normal and not more than 10,000 per cubic millimeter when the erythrocyte and blood platelet counts are extremely low.

Nontropical Sprue with Tetany.—Radl and Fallon present a case of nontropical sprue with tetany in which the first symptom of illness was soreness of the tongue, which began insidiously about eight years before admission to the hospital. The first gastro-intestinal symptoms occurred about six years later, when a change in the character of the stools was observed. Nineteen months later, on the patient's second admission to the hospital, no changes were detected except that a vague mass was palpated 3 cm. below the right costal margin. It was not tender or movable. The response to medical treatment for peptic ulcer was poor; therefore, a typical posterior gastro-enterostomy was performed with the anastomosis made transverse along the greater curvature. A large duodenal ulcer extended over almost the entire first portion of the duodenum, narrowing it greatly. The second portion of the duodenum seemed normal. The lesser peritoneal sac showed signs of recent inflammation by adhesions. Convalescence was uneventful. On the patient's third admission to the hospital because of an attack of severe, painful tetanic contracture and flexion of the forearms, hands and legs below the knees, slight edema of the legs was noted. The edema was unaffected by posture. By the administration of calcium lactate and parathyroid extract the attacks of tetany were controlled. The patient's weight increased from 38 to 41 Kg., while his edema diminished. Three months later he was readmitted because tetany recurred. Attacks came on daily and lasted from one-half to one hour. The edema of the legs increased markedly, especially that in the left leg. There was considerable abdominal distention. Large doses of viosterol gave no definite improvement. The tetany has not been controlled by diet; large doses of calcium lactate and parathyroid extract are necessary over and over again.

Gastroduodenal Lesions and Hematemesis.—Rivers and Wilbur state that intrinsic gastroduodenal lesions, that is, peptic ulcer, gastric carcinoma, inflammatory processes and benign tumors, accounted for approximately 90 per cent of 668 cases of hematemesis. On the basis of their observations the authors believe that the most common single lesion responsible for hematemesis is peptic ulcer, including duodenal, benign gastric and anastomotic ulcers, which comprised 85 per cent of the cases of hematemesis due to intrinsic gastroduodenal lesions. Carcinoma of the stomach was the etiologic factor in only 12.6 per cent of the cases of hematemesis. Hematemesis usually appears like coffee-grounds in gastric carcinoma, and the bleeding is rarely profuse. Massive hematemesis occurs in only 1 per cent of the cases of gastric carcinoma. Localized or diffuse areas of inflammatory reaction of nonspecific character in the stomach, duodenum or surrounding a gastro-enteric stoma may lead not only to symptoms suggestive of peptic ulceration but to hemorrhage, and yet such areas may not produce sufficient abnormality in the contours or functions of these organs to be recognizable roentgenologically. Such an inflammatory area may be one of the underlying causes of bleeding previously described as gastrostaxis by White and others. Benign tumors of the stomach and duodenum and gastric tuberculosis and syphilis are rare causes of hematemesis, and their diagnosis usually depends on roentgenologic or surgical observation. The mechanism of bleeding of the various intrinsic gastroduodenal lesions causing hematemesis are considered.

Arkansas Medical Society Journal, Little Rock

29: 101-118 (Oct.) 1932

The Ophthalmologist's Inheritance. O. H. King, Hot Springs.—p. 101.
The General Practitioner and Family Physician. B. L. Ware, Greenwood.—p. 104.
Cutaneous Blastomycosis: Report of Five Cases. R. I. Millard, Dardenelle.—p. 107.

Colorado Medicine, Denver

29: 390-424 (Oct.) 1932

Public Health and the Medical Profession. F. B. Stephenson, Denver.—p. 393.
Habit Forming Drugs. E. Jackson, Denver.—p. 398.
Acrodynia. J. D. Geissinger, Pueblo.—p. 400.
*Septicemia in Children. M. M. Ginsburg, Denver.—p. 406.

Septicemia in Children.—Ginsburg discusses the etiology, pathology, symptomatology, diagnosis, prognosis and treatment of septicemia from the pediatric point of view. He presents observations from twelve cases of septicemia in children. He concludes that cryptogenic septicemias in which one cannot demonstrate the original focus of infection are probably much more frequent than are recognized. The diagnosis of septicemia is often missed because one organ or another carries the burden of the attack and distracts one's attention from the clinical picture in its entirety. The mortality rate in septicemia remains extremely high. There is no effective treatment for septicemia. The injection of various dyes intravenously and repeated transfusions have given variable results. General supportive measures should be employed in all cases.

Florida Medical Association Journal, Jacksonville

19: 143-182 (Oct.) 1932

Recent Progress in Juvenile Sinusitis. M. A. Lischkoff, Pensacola.—p. 149.
Urinary Obstruction, Recognition of Its Cause and Relief. G. Timberlake, St. Petersburg.—p. 153.
The Synchronizer: Further Report on Two Aspects of Hypertension. M. J. Myres, Daytona Beach.—p. 158.
Spinal Anesthesia. C. Anderson, Tampa.—p. 167.
Spontaneous Subarachnoid Hemorrhage: Report of Three Cases. H. Fuller, Mulberry.—p. 168.

Indiana State Medical Assn. Journal, Fort Wayne

25: 443-488 (Oct. 15) 1932

Activities of Indiana State Medical Association During 1932: Presidential Address. F. S. Crockett, Lafayette.—p. 443.
*Vitamin B Intravenously for Treatment of Neurologic Changes in Pernicious Anemia. P. J. Fouts, G. F. Kempf, J. A. Greene and L. G. Zerfas, Indianapolis.—p. 448.
*Tannic Acid to Control Alarming Hemorrhage: Case Report. J. C. Fleming and J. M. Fleming, Elkhart.—p. 451.
Malignancy of Testis: Report of Three Cases. J. F. Balch, Indianapolis.—p. 453.
Popularizing Ether-Oil Rectal Analgesia in Obstetrics. C. O. McCormick, Indianapolis.—p. 454.

Vitamin B in Pernicious Anemia.—Fouts and his associates gave six patients with pernicious anemia and one with carcinoma of the stomach, having central nervous system involvement, intravenously a concentrated extract of vitamin B over periods of from one to more than seven months, with no improvement of the neurologic signs. All patients noted an improvement in appetite, strength and a sense of well being at the beginning of treatment. This concentrated vitamin B preparation, containing mainly the antineuritic factor and but little vitamin B, was not able to maintain the patients' red blood cell counts and hemoglobin percentages at their original levels, when given intravenously.

Tannic Acid and Hemorrhage.—The Flemings report in detail a case of hemorrhage, from a wound in the left axilla, that was arrested with powdered tannic acid. They conclude that while the astringent properties of tannic acid have been common knowledge among the members of the medical profession, its use as a styptic and coagulant to control capillary oozing in infected tissue has not been, to say the least, common practice. This may be explained partly perhaps by the fact that the rigorous training of the modern surgeon in aseptic technic has led him to regard with repugnance the introduction of any foreign substance into a wound. The authors' experience in their case, however, of seeing this agent, with almost magic promptness and thoroughness, cause a complete cessation of all bleeding in a wound after all the usual and accepted agents had failed, and accomplishing this without exerting any deleterious effects on subsequent healing, led them to believe that tannic acid should occupy a definite place in the modern surgeon's armamentarium for the control of septic bleeding. The remarkable recovery of function of the arm in their case in spite of the mutilating incision for drainage, severing two thirds of the pectoralis major muscle, demonstrates the relatively good prognosis possible when careful supervision, with active and passive motion and massage, is carried out.

Laryngoscope, St. Louis

42: 741-820 (Oct.) 1932

Auditory Acuity in Hypercholesteremia. N. Thaler, Brooklyn.—p. 741.
Significance of Blood Cholesterol in Atrophic Rhinitis. A. Wachsberger, New York.—p. 749.
Value of Hematology to Otologist. A. Weiss, New York.—p. 754.
Management of Biopsy in Laryngeal Cases. A. Plaut, New York.—p. 764.
Recent Advances in Application of Biochemistry to Otology. Ella A. Fishberg, New York.—p. 766.
Prognostic Value of Streptococcic Subculture in Affections of Ear. L. G. Hadjopoulos, New York.—p. 771.
Use of "Negocoll" and "Hominit" in Making of Moulages as Aid to Plastic Surgery. S. Iglauer, Cincinnati.—p. 774.
New Method of Treating Suppurative Diseases of Nasal Sinuses by Use of Warm Medicated Vapor Containing Nascent Iodine. W. A. Wells, Washington, D. C.—p. 779.
Giant Cell Tumor of Septum Nasi. H. S. Wieder, Philadelphia.—p. 786.
Use of Caloric Nystagmus Elicited by Weak Stimuli and Its Partial Phenomena in Otoneurologic Diagnostics. T. German, Budapest, Hungary.—p. 788.
Acoustic Reflexes on Muscles of Middle Ear: Preliminary Communication. R. L. de No, St. Louis.—p. 801.

Nebraska State Medical Journal, Lincoln

17: 361-412 (Sept.) 1932

Use of Pedicled Flaps and Skin Grafts in Reconstructive Surgery of Head and Neck. F. A. Figi, Rochester, Minn.—p. 361.
Cardiac Enlargement. F. W. Niehaus, Omaha.—p. 365.
Diseases of Thyroid Gland. B. B. Davis, Omaha.—p. 372.
Infant Feeding. E. S. Wegner, Lincoln.—p. 377.
Clinical Aspects of Excretion Urography. A. D. Munger, Lincoln.—p. 381.
Mumps with a Double Complication of Meningitis and Pancreatitis. W. J. Gentry, Gering.—p. 383.
Investigation of Sterility. H. S. Morgan, Lincoln.—p. 386.
Report of the A. M. A. Session at New Orleans, 1932. B. F. Bailey, Lincoln.—p. 389.
Dr. Herman von Wechlinger Schulte: An Appreciation. N. Michels, Philadelphia.—p. 394.
Abdominal Actinomycosis. J. W. McGee and F. C. Hill, Omaha.—p. 397.
Alarming Symptoms Following Maxillary Sinus Medication: Case Report. D. D. Sanderson, Lincoln.—p. 400.
Rupture of Uterus in Seventh Month of Pregnancy Through Scar of Curet Perforation. C. H. Waters, Omaha.—p. 401.

New England Journal of Medicine, Boston

207: 637-684 (Oct. 13) 1932

*Diet, Nutrition and Infection. A. F. Hess, New York.—p. 637.
Acute Recurrent Intussusception in Children: Case Reports. A. Thorndike, Jr., Boston.—p. 649.
Infantile Eczema Problem. L. W. Hill, Boston.—p. 655.
Pulmonary Embolism Following Simple Fracture. F. G. Balch, Jr., Boston.—p. 660.
*Pigmentation from Perfume: "Berlock" Dermatitis. J. G. Downing, Boston.—p. 660.
Smallpox in Utero. B. G. Horning, Hartford, Conn.—p. 663.
Advances in Neurologic Surgery. T. J. Putnam, Boston.—p. 664.

Diet, Nutrition and Infection.—Hess states that the antirachitic factor, whether given as ultraviolet irradiation, as viosterol or as cod liver oil, does not increase the immunity of infants to respiratory infections. Respiratory infections are not due to a lack of vitamin A and generally cannot be lessened by giving a diet rich in this factor even when supplemented with cod liver oil. The average infant seems to receive an adequate amount of vitamin A in its milk, judging by the fact that xerosis of the eyes is exceedingly rare and that no gain in weight or increase in immunity is brought about by adding vitamin to the diet. The same seems to hold true for older children and adults, in view of the infrequency of night blindness, the first sign of this deficiency. A lack of vitamin C may induce heightened susceptibility to infection of the respiratory tract. It may, however, induce merely local susceptibility without appreciable loss of systemic immunity. This peculiar phenomenon is manifested by the occurrence of typical nasal diphtheria, associated with virulent diphtheria bacilli, but a Schick reaction negative to highly potent solutions of toxins.

Pigmentation from Perfume.—Downing reports three cases of pigmentation due to the combination of perfume and sunlight. Artificial light and the same perfume did not produce pigmentation on a person previously affected by the first combination. It seems, therefore, that a source of artificial light cannot produce the same results that noonday sunshine will. In reviewing the literature the author found that oil of bergamot, which is chiefly used for perfumery, was the offending substance in most cases reported. Pigmentation thus caused is transient and can be removed by a simple desquamating lotion.

Public Health Reports, Washington, D. C.

47: 2007-2038 (Oct. 7) 1932

Public Health Education: Functions of the University and of the Private Foundation. J. Sundwall.—p. 2007.

Rhode Island Medical Journal, Providence

15: 163-174 (Oct.) 1932

Some Sidelights in Biography of My Great Great Grandfather, Caleb Fiske, M.D., Army Surgeon, Physician, Jurist, Financier. Louisa Paine Tingley, Providence.—p. 163.

South Carolina Medical Assn. Journal, Greenville

28: 243-262 (Oct.) 1932

Tuberculosis in Children. G. S. Clinkscales, Anderson.—p. 247.
Trudeau School of Tuberculosis. W. L. Byerly, State Park.—p. 251.
High Spots of Tuberculosis Program in South Carolina from Standpoint of Voluntary Agency. Mrs. D. McL. McDonald, Columbia.—p. 253.

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An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Experimental Pathology, London

13: 403-466 (Oct.) 1932

Toxic Effects of Excessive Doses of Irradiated Ergosterol on Young Animals. N. B. Taylor and C. B. Weld.—p. 403.
Studies on Clostridium Chauvei: I. Analysis of "H" and "O" Antigens of C. Chauvei. D. W. Henderson.—p. 412.
Id.: II. Active Immunization with Pure "O" Antigen. D. W. Henderson.—p. 421.
*Blood Guanidine in Hypertension. O. L. V. S. de Wesselow and W. J. Griffiths.—p. 428.
Heat-Stable Precipitating Substance Extracted from Vaccinia Virus. W. Smith.—p. 434.
Sizes of Different Bacteriophages. W. J. Elford and C. H. Andrewes. —p. 446.
Isolation of Organisms in Presence of B. Proteus. R. M. Fry.—p. 456.
Propagation of Fujinami's Fowl Myxosarcoma in Ducklings. W. E. Gye. —p. 458.
Morphologic Study of Psittacosis Virus, with Description of Developmental Cycle. S. P. Bedson and J. O. W. Bland.—p. 461.

Blood Guanidine in Hypertension.—De Wesselow and Griffiths, in a study of twenty-eight hypertensive patients and thirteen normal controls, found the blood "guanidine," as estimated by the modified method of Minot and Cutler, to exceed the normal upper limit in nine of twenty-three determinations on the blood of hypertensive patients. In successive determinations on individual hypertensive persons, gross fluctuations in blood guanidine may occur without corresponding alterations in the blood pressure. The blood guanidine tends to be low in acute glomerulonephritis, preeclampsia and eclampsia. In cases of nitrogenous retention the blood guanidine is not necessarily increased. Arginine-rich food, given to rabbits, does not appreciably increase the guanidine content of their blood.

British Journal of Ophthalmology, London

16: 577-640 (Oct.) 1932

Study of Sun Glare in Iraq. P. C. Livingston.—p. 577.

16: 641-704 (Nov.) 1932

Anterior Dialysis of Retina: Disinsertion or Avulsion at Ora Serrata. J. R. Anderson.—p. 641.
Colored Areas in Sclerotic. C. H. Usher.—p. 671.
Memorandum Regarding Family in Which Neuroretinal Disease of Unusual Kind Occurred Only in Males. E. Thomson.—p. 681.
Retinal Glioma Treated by Insertion of Radium Needles in Orbit: Case. V. McDowall and E. O. Marks.—p. 686.

British Journal of Radiology, London

5: 737-800 (Oct.) 1932

*Osteoplastic Metastases in Prostatic Carcinoma. P. Cave.—p. 745.
Roentgen Ray Treatment of Ringworm of Scalp. S. C. Shanks.—p. 761.
Relation Between β and γ Radiation in Treatment of Tumors. J. C. Mottram.—p. 768.
*Increase in Fragility of Red Blood Corpuscles After Exposure to Radium. Daphne Goulston.—p. 775.
New High-Tension Voltmeter for Direct Measurement of Tube Voltage During Diagnosis and Therapy. K. W. Müller.—p. 780.
Roentgen Ray Diagnosis in Case of Pancreatic Calculus. H. K. G. Hodgson.—p. 783.

Osteoplastic Metastases in Prostatic Carcinoma.—Cave presents a case of osteoplastic bone metastases from a primary carcinoma of the prostate. The roentgenologic appearance of the affected bones was striking, and was instrumental in the formation of a correct diagnosis. Chemical analysis and microscopic examination were made of a vertebra removed post mortem. The author discusses various theories of the causation of osteosclerosis in metastatic carcinoma and stresses the possible importance of local arterial obstruction as a causative factor. Statistics are given of the distribution and frequency of certain bone metastases. These show that the bones most liable to such metastases are those nearest to the primary growth. The theory is advanced that osteoplastic metastases result from lymphatic spread and that osteoblastic metastases are due to vascular dissemination. Chemical analysis of the vertebra suggested that the local calcium metabolism had been disturbed. The percentage of inorganic matter was increased and there was a 44 per cent increase in calcium carbonate. Both of these factors were responsible for the increased density of the bone. The author offers the following suggestions by which osteoplastic carcinomatous metastases may be produced: 1. Spread from the primary growth is by way of the lymphatics. 2. The ligaments and periosteum are infiltrated. 3. Cancer cells invade the bone either through the haversian canals or through lymphatic channels. 4. The blood vessels of the periosteum, and sometimes the blood channels of the bone, become blocked with cancer cells; this leads to diminished blood supply. 5. Restriction of the blood supply deprives the bone cells of an internal secretion—probably from the parathyroids, which normally control calcium metabolism. 6. Under these abnormal conditions, calcium is retained which normally would be excreted; some of the calcium is laid down as carbonate instead of as phosphate. 7. New bone encroaches on the haversian canals and medullary spaces, making the whole bone abnormally dense.

Fragility of Red Blood Corpuscles After Exposure to Radium.—The experiments of Goulston showed that with beta radiation the filtration was 0.12 mm. of silver. No hemolysis was observed in specimens of blood taken from human beings, rats and fowls after eighteen hours' irradiation. Four specimens of human blood irradiated for twenty-five hours showed slight hemolysis, and there was a decided increase in the fragility of a human blood irradiated for forty-seven and one-half hours, and also in that of two specimens of human blood and two from fowls irradiated for from sixty-eight to seventy hours. For gamma radiation the filtration was 0.12 mm. of silver and 3 mm. of lead. One specimen of human blood was irradiated for sixty-eight hours; only a slight increase in fragility was obtained. Another specimen of rat's blood, irradiated for 119 hours, showed little more hemolysis. Two specimens of rat's blood irradiated from sixty to seventy hours were allowed a further period of from sixty to seventy hours' rest before being subjected to fragility tests. These showed only slight hemolysis of corpuscles.

British Journal of Surgery, Bristol

20: 185-360 (Oct.) 1932

Calcareous Deposits in Supraspinatus Tendon. R. C. Elmslie.—p. 190.
Analysis of Mortality in Acute Appendicitis with Respect to Drainage and Variety of Operation. G. H. Colt and Margaret M. M. Morrison. —p. 197.
Surgery of Encapsulating Chronic Peritonitis. H. B. Devine.—p. 204.
Repair of Cleft Palate, with Notes on Administration of Anesthetics. A. Mitchell and J. R. MacKenzie.—p. 214.
Megacolon: Evidence in Favor of Neurogenic Origin. W. A. D. Adamson and L. Aird.—p. 220.
*End-Results of Perineal Excision and of Radium in Treatment of Cancer of Rectum. W. B. Gabriel.—p. 234.
Delayed Hemorrhage Following Traumatic Rupture of Spleen. A. H. McIndoe.—p. 249.
*Malignant Giant Cell Tumor of Bone. E. S. J. King.—p. 269.
Relationship Between Peptic Ulceration and Gastric Carcinoma. W. D. Newcomb.—p. 279.
Report on the Strangeways Collection of Rheumatoid Joints in the Museum of the Royal College of Surgeons: Part II. Some Natural Features and Histologic Peculiarities of Osteoarthritis and Rheumatoid Arthritis. R. L. Knaggs.—p. 309.
Tuberculous Hyperplasia of Large Intestine (Human Tubercle Bacillus): Report of Case with Unusual Features. J. Anderson and W. T. Munro.—p. 331.
Method for Production of Increased Compression Strength of Bone: Experimental Study: Preliminary Report. D. Ross.—p. 337.

Cancer of Rectum.—Gabriel presents the results of 370 cases of perineal excision of the rectum and emphasizes the importance of Dukes' classification of rectal cancers, for this method enables the early cases to be separated from the late cases. He tells of the excellent results, both immediate and remote, that can be expected in groups A and B, together with the bad prognosis in those cases in which metastasis has occurred to the regional lymph nodes. In operable adenocarcinoma there have been two good results out of twelve cases treated with radium: this is a poor showing compared with the results of perineal excision and accounts for the present opinion that radical operation holds out the best chance of cure to the patient. The dangers of abdominal irradiation and of posterior barrage have been sufficiently indicated. The futility of needling in C cases at operation and cases of recurrent cancer is also evident. There was no case in the author's series in which an inoperable rectal cancer had been rendered operable by the use of radium. The intrarectal insertion of radon seeds carries the least operative risk of the various methods of radium needling, but whether this form of radiation can produce anything better than a temporary palliation it is not yet possible to say from a study of the author's patients. The most hopeful results have been obtained in the

case of operable squamous carcinoma of the anus, this class of case having given 50 per cent of good results up to three years. This type of growth appears to respond much better to radium than adenocarcinoma, but it must be taken into account that the growths are much more accessible and the needling can therefore be carried out more effectively.

Malignant Giant Cell Tumor of Bone.—King describes an example of a malignant form of giant cell tumor of bone and discusses the means by which the malignant growth may be distinguished from the innocent form. Microscopically the stroma is cellular, composed mainly of spindle cells with active nuclei and an occasional mitotic figure. Tumor giant cells, when present, are characteristic. Foreign body giant cells and pleomorphic stroma, so characteristic of the innocent "growth," must be disregarded when determining prognosis, since they may predominate if degeneration, infection or bone destruction is present in the area under examination. In order to minimize this difficulty, specimens should be taken when possible from areas that do not show these complications. In the later stages of development of the growth there is a characteristic roentgenologic appearance. Thus it is necessary in a doubtful case to make roentgenologic examinations at intervals in order to observe the earliest sign of invasion of the bone cortex or the surrounding tissues. Several portions of the growth should, if possible (e. g., when curettage is performed), be examined. Positive evidence of any kind, even if found in only one part, should be accepted to the exclusion of negative evidence.

British Medical Journal, London

2: 657-698 (Oct. 8) 1932

*Serum Treatment of Pneumonia. R. L. Cecil.—p. 657.
*Treatment of Lobar Pneumonia by Antipneumococcic Serum. R. R. Armstrong and R. S. Johnson.—p. 662.
Treatment of Inflammatory Conditions by Radiations. J. H. D. Webster. —p. 665.
Drug Resistance, with Especial Reference to Trypanosomiasis. W. Yorke. —p. 668.
Recurrent Boils: Some Points Relating to Etiology, Complications and Treatment. R. Hallam.—p. 670.

2: 699-738 (Oct. 15) 1932

Indications for, and Results of, Removal of Spleen. Dawson.—p. 699.
Removal of Spleen. Moynihan.—p. 701.
Pneumococcic and Streptococcic Peritonitis. L. E. Barrington-Ward. —p. 704.
Effects of Anesthetics on Liver. W. Bourne.—p. 706.
Note on Hepatic Insufficiency, with Especial Reference to Effects of Drugs Used in Treatment of Arthritis, Gout and Rheumatism. H. A. Harris.—p. 707.
Intensive Vitamin Therapy in Measles. J. B. Ellison.—p. 708.

Serum Treatment of Pneumonia.—According to Cecil, the three dominant types of pneumococci are responsible (in America) for two thirds of all pneumococcic pneumonias. Type I pneumococcus is the most highly parasitic of the types, causing one third of all pneumococcic pneumonias. Type II ranks second, producing one fourth of the total. Both type I and type II pneumococcic infections of the lung are amenable to serum treatment. In type I pneumonia the results of serum treatment are excellent. In type II pneumonia the effect of serum, while not so striking as in type I cases, is nevertheless definite. The development of a refined, concentrated and polyvalent antipneumococcus serum has reduced the serum therapy of pneumonia to a simple, practical and valuable therapeutic measure. The author's method of administering Felton's serum at the present time is as follows: As soon as the diagnosis of lobar pneumonia has been made, the pneumococcus type is determined. By combining the original mouse method of sputum examination with the rapid methods of Krumwiede and of Sabin, it is possible to obtain the pneumococcus type in a high percentage of cases in from one to five hours. If no sputum is available, a generous swab is made from the posterior pharynx and transferred to a tube of broth, which is allowed to incubate for two hours at a temperature of 37 C. One cubic centimeter of this culture is then injected into the peritoneum of a mouse, and microscopic or macroscopic typing is performed. All readings, by whatever method obtained, are confirmed by typing the cultures obtained from the heart's blood of the mouse. The patient is first questioned as to previous injections of serum and as to history of hay fever, asthma or hives. An intradermal and a conjunctival test are then made with a one in ten dilution of normal horse serum. If after fifteen minutes these tests are both negative, 5 cc. of Felton's serum is slowly injected intravenously. If the patient shows no reaction to this first injection of serum, a second injection of from 15 to 20 cc. is given intravenously from one to two hours later, and this dose is repeated every two or three hours until the patient has received approximately 100,000 units. The amount of serum administered on the following day is determined by the clinical condition of the patient. If his condition has improved and if his chart shows a decided drop in temperature, pulse rate and respiration rate, the amount of serum administered is approximately one half of that administered on the first day. If, on the other hand, the patient's condition is worse, or if it remains unchanged, the intensive treatment is continued. On the third day the same policy is pursued. If the patient's temperature is under 100 F., and if his condition is good, the general rule is to give one or possibly two 10 cc. injections to prevent relapse. The author has found from experience that if any benefit is to result from serum treatment it is usually apparent after two or, at the latest, three days of treatment.

Serum Treatment of Lobar Pneumonia.—Armstrong and Johnson emphasize the fact that it is important to realize that treatment by concentrated antipneumococcic serum does not replace general measures, of which the most essential are: (1) a minimum disturbance of the patient, (2) early digitalization to conserve cardiac energy, (3) sedatives to procure sleep, (4) dextrose, with alcohol as required, to furnish a readily assimilable food, and (5) oxygen—less often necessary in the treated than in the untreated case, owing to the favorable effect of serum on the cyanosis and toxemia. The authors believe that the serologic type of the responsible pneumococcus in lobar pneumonia can be decided in a few minutes, early in the illness, by a simple direct test on the patient's sputum. No special apparatus or skill is required. They do not use animal inoculation. Approximately two thirds of the cases of lobar pneumonia in winter are due to infection by pneumococcus types I and II and are therefore suitable for serum treatment. At the beginning of treatment an initial desensitizing dose of 1 cc. of serum should be injected intravenously, to be followed, from twenty to thirty minutes later, by the main inoculum. Serum treatment shortens the duration of fever and favors termination by crisis, particularly in type I infections. There is a marked symptomatic improvement following serum treatment. The earlier serum is administered the more frequently is the illness aborted, the favorable effects observed being inversely proportional to the time elapsed from onset of illness till serum treatment. Serum treatment appears to restrict the spread of pneumonia from one side of the chest to the other, particularly in type I infections. Complications and sequelae are apparently uninfluenced by serum treatment. The results of serum treatment in the severest type of case have been, on the whole, unsatisfactory. Further research is needed in this direction.

Lancet, London

2: 717-770 (Oct. 1) 1932

Local Outbreak of Devonshire Colic. M. C. N. Jackson and L. N. Jackson.—p. 717.
Mortality from Hematemesis: Supplementary Analysis. E. Bulmer.—p. 720.
Mortality of Severe Hemorrhage from Peptic Ulcers. W. E. Chiesman. —p. 722.
*Vitamin A Content of Liver in Puerperal Sepsis. H. N. Green.—p. 723.
Twenty Years' Experience with Artificial Pneumothorax. H. de C. Woodcock.—p. 726.
*Allergic Skin Reaction After Scarlet Fever. H. J. Gibson and J. P. McGibbon.—p. 729.
An Aid in Treatment of Toxemia of Pregnancy. S. J. Cameron.—p. 731.
Some Points in Diagnosis and Treatment of Acute Retropharyngeal Abscess. N. Asherson.—p. 732.

Vitamin A Content of Liver in Puerperal Sepsis.—Green determined the vitamin A content of the liver, by the antimony trichloride test, in twenty cases of puerperal sepsis treated with large doses of vitamin A and in fourteen morbid puerperal cases untreated with the vitamin. A large proportion of the vitamin taken by mouth was not found in the liver and was apparently rapidly destroyed in the body. He found low vitamin A reserves in several cases in spite of intensive treatment. In such cases, septic thrombophlebitis was a frequent complication. He suggests that in degenerated conditions of the liver the liver cell is unable to retain the vitamin. In two cases the liver was completely devoid of vitamin, accord-

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ing to the colorimetric test, but there were no clinical signs of vitamin A deficiency during life.

Allergic Skin Reaction After Scarlet Fever.—In a series of twenty-eight cases of scarlet fever, weekly intracutaneous tests have been carried out by Gibson and McGibbon with an extract prepared from cultures of hemolytic streptococci representing the soluble intracellular products of the organisms freed from diffusible substances. The extract was diluted 1:100 for the test. All tests were intradermal in the volar aspect of the forearm, 0.2 cc. of the material being injected. Readings were made at twenty-four, thirty-six and forty-eight hours. The skin reactions to the bacterial extracts were found to be maximal after thirty-six hours. In twenty-two of the twenty-eight patients examined the reaction, negative during the first week, developed and became strongly positive by the fourth week. All patients over 7 years of age acquired the allergic reaction. The possible fallacy, that the reaction noted in convalescence is simply a recrudescence of a preexisting skin sensitiveness temporarily inhibited during the fever, is discussed.

Archivio Italiano di Chirurgia, Bologna

32: 401-556 (Sept.) 1932

Cystic Fibrosis of Breast. S. Milone.—p. 401.
Experimental Study of Action of Thermal Mud in Treatment of Fractures. A. Rich.—p. 485.
*Physiopathology of Acute Vicious Circle Due to Gastro-Enterostomy. L. Torchiana.—p. 499.
Leukoplakia of Renal Pelvis. M. Arlotta.—p. 525.
Denervation of Pancreas on Effects of Experimental Hyperglycemia. R. Musumeci.—p. 545.

Vicious Circle Due to Gastro-Enterostomy.—Torchiana studied the functional mechanism of this acute vicious circle in two clinical cases and in experiments on dogs. In one group of dogs he investigated chronic duodenal stasis and in another the importance of duodenal ectasis in the development of the acute vicious circle following gastro-enterostomy. The symptomatology of the second group of dogs (persistent vomiting, anuria, albuminuria, glycosuria, notable gastric and duodenal ectasis) corresponded to the clinical observations. The vomiting of bile was much more abundant in the first group than in the second. In the first group vomiting was due to the violence of the duodenal reflux, which, arriving unexpectedly in the stomach, was unable to escape through the anterior mouth of the anastomosis, whereas in the second group it was due to an abnormal reflex stimulus which came to the stomach from the disturbed motor activity of the duodenum. In the first group the disturbed duodenal function slowly became stabilized and compensated for the abnormal stimuli that influenced the biliopancreatic function. In the second group, in which the total lack of function of the efferent loop was rapidly stabilized, a profound functional disturbance took place either in the gastric and duodenal innervation or in the regulatory apparatus of the biliopancreatic function, causing an acute duodenal ectasis, following hypotonicity of the intestinal wall. The author concludes that, if in order to produce the acute vicious circle following gastro-enterostomy a lack of function of the efferent loop is necessary, a diminution of tonicity of the duodenal wall with its consequent acute ectasis in the afferent loop is the essential condition to maintain and develop this lack of function.

Policlinico, Rome

39: 581-656 (Oct. 15) 1932. Surgical Section

Hepatosplenography. A. Capua.—p. 581.
Cavernous Angioma of Tendon Sheaths. N. Della Mano.—p. 593.
Essential Hematuria and Its Treatment. G. Nisio.—p. 613.
*Perfumed Spirit of Bergamot: New Antiseptic in Surgery. A. Spinelli.—p. 627.

Perfumed Spirit of Bergamot in Surgery.—Spinelli reviews the literature and states the results of his investigations on men and animals. He found that the spirit of bergamot has a decided bactericidal action on the epidermis as well as in the thickness of the derma. Thus it may be used as a disinfectant of the hands by the surgeon before performing an operation. It never causes irritation of the skin or mucous membrane. Furthermore, it has no toxic action through absorption and does not stain the skin or the linen coming in contact with it. It is sometimes applied to putrid lesions, as in cases of ozena, in order to cover up the unpleasant odor. Bergamot, combined with other substances, may be used for staining in special surgical operations; when mixed with an ethereal solution of indigo carmine it turns a dark blue, and when mixed with an alcoholic 10 per cent solution of trinitrophenol it turns a bright yellow.

Semana Médica, Buenos Aires

39: 997-1080 (Oct. 13) 1932. Partial Index

Present Status of Technic of Surgery in European Surgical Centers. G. Bosch Arana.—p. 997.
Progressive Muscular Atrophy as Late Manifestation of Poliomyelitis. V. Dimitri.—p. 1002.
Bronchomycosis Caused by Penicillium Crustaceum: Case. F. L. Niño.—p. 1015.
*Perifocal Tuberculous Infiltration of the Lung in Children. A. N. Accinelli.—p. 1020.
Psychoses Caused by Hypoglycemia Following Insulin Therapy. L. Gravano.—p. 1049.
Mediastinal Pachypleuritis: Case. J. M. Macera and E. Martinez.—p. 1051.
Whipple Liver Therapy in Pernicious Anemia: Case. A. J. Scopinaro.—p. 1062.

Perifocal Tuberculous Infiltrations.—From his clinical and roentgen observations in seven children, Accinelli concludes that perifocal infiltrations of the lung are of tuberculous etiology, being caused by toxins of the tubercle bacillus. As a rule the condition follows a benign evolution toward recovery. Hence the number of necropsies is too small to enable one to draw any definite conclusions about the pathologic anatomy of the condition. At necropsy, characteristic lesions are found at the seat of the infiltration that has developed around tuberculous foci in the lung and in the corresponding lymph nodes. The functional disturbances of the lung and the physical symptoms are negligible in comparison to the large size of the area of infiltration, such as it appears in the roentgen image. Perifocal infiltrative reactions last for a period varying from months to years and then the lesions heal. They occur frequently, especially those of small size. Their characteristic evolution serves as a basis for the diagnosis. The roentgen examination of the patient is of primary importance for early diagnosis of the presence of the infiltrative reaction and to ascertain its evolution. The prognosis as to life is good. However, it is advisable to perform frequent examinations of the patient, because a condition of diminished resistance to the development of secondary infections frequently follows the primary infection. The patients obtain a complete clinical recovery, although some of the pulmonary lesions persist and are clearly visible on the roentgenogram for some time. The treatment in general is that of pulmonary tuberculosis; the patient should have rest and fresh air, should be slightly overfed, and should be given calcium preparations and tonics. It is advisable to avoid treatments that may have a congestive effect, such as injections of methylic antigen, tuberculin, gold therapy, heliotherapy and thalassotherapy.

Archiv für klinische Chirurgie, Berlin

173: 1-856 (Oct. 21) 1932. Partial Index

*Attitude of Surgery Toward Coutard Method of Irradiation in Treatment of Malignant Tumors. P. Clairmont.—p. 312.
Relief of Intracranial Pressure in Brain Tumors. H. Peiper.—p. 386.
*Combined Method of Encephalo-Arteriography. W. Löhr and W. Jacobi.—p. 399.
*Exophthalmic Goiter and Artificial Stimulation of Thyroid Function. E. Schneider.—p. 421.
*Operating on and Healing of Wounds in Previously Irradiated Areas, Especially in Breast Carcinoma. O. Jüngling.—p. 443.
Demonstrations in Field of Thoracic Surgery. F. Sauerbruch.—p. 457.
Operative Indications in Pulmonary and Bronchial Injuries. R. Nissen.—p. 464.
Late Result of Stomach Corrosion by Hydrochloric Acid. W. Noetzel.—p. 475.
Result of Occlusion of Splenic Artery by Fascia in Four Cases. E. Payr.—p. 480.
*Rôle of Liver in Surgery. C. Henschen.—p. 488.
Liver Surgery. T. Brugsch.—p. 647.
Changes in Liver Produced by Ligation of Left Branch of Portal Vein. F. Oehlecker.—p. 663.
Effect of Thalma's Operation on Liver Cirrhosis. A. Herrmannsdorfer.—p. 682.
Value of External Cholelochoduodenostomy in Treatment of Purulent Cholangeitis and Biliary Obstruction. H. Finsterer.—p. 685.
Hepaticogastrostomy in Obliteration of Common Bile Duct. J. Hohlbaum.—p. 693.
Roentgen Demonstration of Liver and Spleen. C. Reimers.—p. 697.

Coutard Method of Irradiation of Malignant Tumors.—Clairmont discusses the results of treatment of certain clinical types of malignant tumors with the irradiation method

of Coutard of Paris. The latter, in 1921, proposed a fractional method of irradiation, giving frequent, usually daily, small doses of roentgen rays. The resulting cumulative dose was unusually large. The method was applied in the Zurich clinic for a period from 1929 to 1931. The author prefers to speak of good results rather than of cures, since the latter implies a three or a five year period. Only those cases were selected in which, because of localization, surgical intervention was beset with great difficulties, grave dangers, numerous complications and poor remote results even when successful. Tumors of the palate, of the base of the tongue, of the pharynx and of the larynx constituted the groups treated. "Good result" indicated here the disappearance of the tumor and, in the case of regional lymph involvement, of the disappearance of the glandular swelling as well. The general mortality was 10 per cent. In 15 per cent good results were obtained, in 26 per cent an improvement, while 46 per cent were not benefited. Best results were obtained in neoplasms of the tonsil. Out of a group of sixteen, four gave a good result and in seven improvement resulted. In two patients both the tumor and the regional lymph node enlargement disappeared. One of these was considered inoperable. In twenty-one cases of carcinoma of the base of the tongue only one patient died, 50 per cent were not improved, but in 20 per cent good results were obtained. In eight cases of malignant conditions of the hypopharynx, of which five presented regional lymph node enlargement, the tumor and the glandular enlargement disappeared after treatment and the patients were well when observed from sixteen to twenty-one months later. Two patients with intralaryngeal tumor were well eighteen and thirty months later. Contrasted with the notoriously poor results of operative treatment, the results thus far obtained with the Coutard method have the advantage of sparing much suffering to the patient and securing a better result. The author therefore is of the opinion that neoplasms of the tonsil, the pharynx and the larynx should in the future be treated by prolonged fractional roentgen irradiation rather than by surgical removal. In esophageal carcinoma their results were poor even when the roentgen irradiation was combined with the method of radium implantation.

Combined Method of Encephalo-Arteriography.—Löhr and Jacobi describe a new method of encephalography; namely, a combination of ventriculography with arteriography. Moniz, a Portuguese investigator, used the method of arteriography before them, but not in combination with encephalography. Using sodium iodide as an opaque medium he reported fatalities, palsies, disturbances of speech and, not infrequently, epileptic seizures in the course of injection. The authors used Thorotrast in amounts of 8 to 10 cc. for adults and only a few cubic centimeters for children. The injection was performed on the x-ray table, the roentgenogram being taken at the moment of injection. The injection was made into the internal carotid artery exposed and isolated by dissection. In eighty injections made on forty-two patients the authors did not observe the slightest disturbance of the central nervous system. They did not observe any rise of temperature or any disturbance of respiration or of heart action. The safety of the method is due to the speed with which Thorotrast leaves the brain as well as to its colloidal state. The medium leaves the brain by the venous route, to be deposited in the reticulo-endothelial elements of the liver and spleen. Little is known regarding its ultimate excretion from the body. Arteriograms are secured in lateral and in fronto-occipital planes. Particularly instructive are stereoplates. It was noted that injections remain limited to the arteries of one hemisphere in spite of the rich collateral communications between the two. An exact knowledge of normal topography of the arterial blood supply is a prerequisite for the reading of arteriograms. Of diagnostic importance are the state of filling of vessels, deviations from the normal course, unusual vascularity and certain appearances in the vicinity of a neoplasm. The authors conclude that the method is harmless and when combined with that of ventriculography does not tax the patient any more than ventriculography alone. They see in the method a valuable addition to the diagnosis and localization not only of tumors but of other pathologic conditions in the brain.

Artificial Stimulation of Thyroid Function.—Schneider points out that while administration of thyroxine in animals produces all the characteristic toxic symptoms, the histologic picture of the gland remains unaltered. The occasional histologic changes observed were those of accumulation of colloid and of flattening of epithelium. Apparently thyroxine is not the only true thyroid hormone capable of raising the metabolism. Stimulation of glandular activity by its own hormone is frequently ineffective. It is more efficiently accomplished either through stimulation of some controlling center or through a synergistic hormone of another endocrine gland. The author injected an anterior pituitary gland preparation in doses of 1 Gm. per 10 Kg. of weight into animals and obtained after only four days of administration a histologic picture typical of a true hyperthyroidism or true exophthalmic goiter. There was the typical sparsity of colloid and a change in the epithelial cells lining the acini from the flat to the high type. Following this, typical secondary manifestations developed. It is his belief that for some time the liver can detoxicate the excessive thyroxine production, but that if the condition is not checked secondary damage will ensue. He therefore urges earlier surgical intervention in cases of hyperthyroidism, before secondary damage, especially to the heart, can take place.

Operating on Wounds in Irradiated Areas.—Preoperative irradiation, according to Jüngling, has undergone a radical change. The single massive dose has been reserved for markedly radiosensitive tumors. It has been replaced by the method of prolonged fractional exposures, the single dose amounting to about 30 per cent of the tolerance dose. The area is divided into four or five fields, one or two being utilized in a daily exposure. The entire treatment is spread over ten to twelve days. The resulting cumulative dose is considerably greater than a single massive dose. The operation follows from three to six weeks later. Radium needles amounting to about 200 mg. were implanted at the end of the operation and removed about six hours later. On the basis of fifty-two cases of operable carcinoma of the breast treated within the past two years as in the scheme outlined, the author concludes that (1) preoperative irradiation led to diminution of the tumor in the majority of the cases; (2) the ensuing radical operation was not rendered particularly difficult thereby, though the tissues were found to be rather dry and brittle; (3) the healing of the wound was not compromised, either by the irradiation or by radium implantation; (4) from a technical standpoint there appear to be no contraindications to preoperative irradiation as well as to radium implantation at the end of operation.

Rôle of Liver in Surgery.—Henschen, in an exhaustive study of the rôle of the liver in surgery, emphasizes the importance of storing up a rich glycogen supply. The function of the liver parenchyma is thereby spared and toxic influences are markedly eliminated. The diet that accomplishes this best is a combination of small amounts of albumin (vegetable albumins preferably) with large amounts of starchy foods. Meat in contradistinction to all other albumins was found to be a good builder of glycogen. Reduction of intestinal toxins is accomplished through elimination of those albumins which contain aromatic amino-acids, such as cheeses. The bile-secreting function can be spared by the elimination of fat and albumin. Among the medicinal measures recommended, the author favors daily infusion of from 1,000 to 2,000 cc. of a 5 per cent dextrose solution in conjunction with insulin administration, 5 to 10 units daily. Calcium gluconate or calcium chloride given intravenously is advantageous. Magnesium sulphate and decholin assist in the cleansing process of the liver. For disinfection of biliary passages rivanol, ethylhydrocupreine or acriflavine hydrochloride are recommended. Administration of thyroid preparations diminishes cholesterol blood content, while that of epinephrine raises it. Chloroform, ether and tribrom-ethanol are contraindicated as anesthetics in manifest hepatopathies. Spinal or local anesthesia is best suited for such. If general anesthesia is indicated, nitrous oxide is least harmful. Venesection with removal of from 400 to 800 cc. of blood followed by transfusion is frequently life saving in hepatargic conditions and in toxemias of hepatogenous origin. As a prophylaxis against cholemic bleeding the author advises repeated blood transfusions, administration of parathyroid extract, heat to the body by means of a quartz lamp and autohemotherapy. Diathermy of the liver in the course of operation is valuable in preventing cooling.

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Dermatologische Wochenschrift, Leipzig

95: 1541-1568 (Oct. 22) 1932. Partial Index

*Feer's Disease: Etiologic and Therapeutic Significance of Liver. M. Fellner.—p. 1541.
Microscopic Observation of Fungus Cultures. W. Engelhardt.—p. 1546.
Therapeutic Malaria. E. Martini.—p. 1548.

Feer's Disease.—Fellner, after mentioning the characteristic symptoms of Feer's disease, describes the clinical history of a boy, aged 18 months. The related case is interesting for the dermatologist, who may be called on to diagnose this peculiar disorder, but also on account of the involvement of the liver, which has never before been mentioned in the description of Feer's disease. That the boy really had Feer's disease cannot be doubted, since nearly all the characteristic symptoms were present. The author thinks that the involvement of the liver is significant for the etiology of Feer's disease, which so far is still problematic. Although he realizes that a single case does not justify generalizations, he thinks that, because the liver symptoms as well as the cutaneous and psychic symptoms disappeared following administration of injectable liver extract, the case is additional evidence for Feer's theory, who considers this disease a sympathetic neurosis. Because liver therapy was effective in this case the author recommends that treatment with liver be tried in other cases of Feer's disease, even if an involvement of the liver is not evident. He thinks that thus it may become possible to throw light on the etiology of the disease. In regard to the dermatologic symptoms of Feer's disease he states that they are not characteristic but only of a secondary nature.

Klinische Wochenschrift, Berlin

11: 1777-1816 (Oct. 22) 1932

To What Extent Does Cataract Explain Structure of Lens? A. Vogt.—p. 1777.
*Therapeutic Experiments with Hypophyseal Hormone Influencing Thyroid. A. Schittenhelm and B. Eisler.—p. 1783.
*Prolan and Growth of Tumors: Inhibiting Influence of Prolan on Growth of Tumors in White Mice. H. Zondek, B. Zondek and W. Hartoch.—p. 1785.
Venography. T. Wohlleben.—p. 1786.
Oral or Intravenous Sugar Tolerance for Testing Glycemic Reaction? E. Urbach.—p. 1789.
*Significance of Aschheim-Zondek Reaction for Clinic of Extra-Uterine Gravidity. H.-U. Hirsch-Hoffmann.—p. 1791.
Specificity of Cholesterol Resorption and Its Biologic Significance. R. Schoenheimer.—p. 1793.
Magnesium Rickets. G. Meyer zu Hörste.—p. 1796.
Reduction of Body Temperature of White Mice by Starvation. A. Buschke and I. Vasarhelyi.—p. 1797.
Nature of Motor Chronaxia. H. V. Kurella.—p. 1797.
Pathogenesis of Gastritis. P. Wichels.—p. 1797.
Contraindications to and Complications in Blood Transfusions. C. Rüdel.—p. 1798.

Therapeutic Experiments with Hypophyseal Hormone.—Schittenhelm and Eisler, after referring to former investigations in which they demonstrated that there is a hypophyseal hormone that stimulates the activity of the thyroid, now relate their clinical experiences with this hormone. In myxedema they noted a considerable increase in the iodine content of the blood, but the basal metabolism remained unchanged. The clinical aspects of myxedema remained uninfluenced by the hormone. In a case of congenital imbecility with abnormal thyroidal action, the iodine content of the blood increased under the influence of the hormone but there was no fundamental change in the clinical condition. In obesity the action of the hormone is weaker than that of thyroxine, but it was possible to reduce the body weight by means of the hormone without causing complications. The subcutaneously injected dose of the hormone is from 600 to 1,000 guinea-pig units a day.

Prolan and Growth of Tumors.—The Zondeks and Hartoch report studies based on the clinical observation that in acromegaly the growth hormone, which in this condition is presumably produced in large quantities, inhibits follicle maturation. Thus it seemed reasonable to examine whether, on the other hand, the hypophyseal hormone effecting follicle maturation would influence growth processes, particularly tumor growth. It may be significant that patients with tumor eliminate in the urine considerable quantities of the hormone of the anterior lobe of the hypophysis. Tests were made on 1,019 sexually mature white mice. The investigations revealed that by means of prolan (containing both the follicle maturation hormone and the luteinization hormone) it is possible to inhibit greatly the growth of inoculated tumors, while in animals not treated with prolan the tumors weighed about 1.65 Gm. after twenty-three days; in animals treated with prolan the tumors weighed only 0.2 Gm. The authors further describe tests in which it was determined that the inhibiting influence of prolan is not exerted by the anorganic substances which it contains. In another series of animals it could be demonstrated that the administration of prolan reduces the growth energy of a tumor to such an extent that in the second animal passage the tumor grows only slightly or not at all.

Aschheim-Zondek Reaction in Extra-Uterine Gravidity.—Hirsch-Hoffmann shows that the Aschheim-Zondek reaction is valuable also in the diagnosis of extra-uterine pregnancy. If there are signs of extra-uterine gravidity and the Aschheim-Zondek reaction is twice positive, an operation is advisable even if puncture does not corroborate the diagnosis. A negative Aschheim-Zondek reaction does not justify a postponement of an operative intervention when all other symptoms indicate an extra-uterine pregnancy. When an extra-uterine gravidity appears likely, it is of course best to resort to the rapid methods of the Aschheim-Zondek test. The reaction may still be positive in extra-uterine gravidity weeks after the beginning of the hemorrhage, but the frequency of positive reactions decreases with the length of time elapsed since the beginning of the hemorrhage. The author cites figures to corroborate this.

Medizinische Klinik, Berlin

28: 1485-1518 (Oct. 21) 1932

Salt-Free Diet in Ulcer and in Hyperacidic Gastritis. G. Katsch.—p. 1485.
*New Observations on Late Forms of Lymphogranuloma Inguinale. H. Löhe and H. Rosenfeld.—p. 1486.
Social Aspects of Therapy of Diabetes. A. V. Knack.—p. 1488.
Endothelial Symptom of Hyperthyroidism. O. Zimmermann.—p. 1491.
Urinary Incontinence. G. Steinitz.—p. 1493.
*Pulmonary Tuberculosis and Renal Diabetes. S. Tannhauser.—p. 1496.
Phlebosclerosis. T. Ruhnstruck.—p. 1497.
Ray Therapy of Experimental Inflammation of Udder of Guinea-Pigs: Relation to Puerperal Mastitis in Human Beings. G. J. Pfalz.—p. 1499.
Investigations on Brucella Abortus Allergy and Serologic Phenomena in Human Beings. G. Straube.—p. 1501.
Dietary Therapy During Childhood. H. von Mettenheim.—p. 1502.

Late Forms of Lymphogranuloma Inguinale.—Löhe and Rosenfeld point out that the successful transmission of material from patients with the anorectal syndrome to the brain of monkeys and the positive skin reaction produced with the brain antigen in patients with lymphogranuloma inguinale has furnished further proof for the unity of the early and late forms of the disease. They maintain that the genito-anal syndrome is a specific, infectious late form of lymphogranuloma inguinale. By retrograde transportation the infectious substances, together with the congesting lymph fluid, are carried from the deep pelvic lymph nodes to the periphery and produce the genital (elephantiasis) and the anal (ulcerous proctitis, elephantiasis) late forms. The lymphogenous transmission into the deep pelvic lymph nodes begins during the early stage of lymphogranulomatosis inguinale. The inguinal glands may be passed by and the disease may take its course without the bubo inguinalis. Manifestations leading to the later forms occur also in men, but their greater incidence in women can be explained by the course of the lymph channels. Syphilis influences lymphogranulomatosis during the early period (reciprocal modification of skin and serorcactions in a form of anergy). By impairing the lymphatic system, syphilis may be an essential factor in the development of late forms. In all diseases of the lower portion of the intestine and in strictures of the rectum, Frei's reaction is of great diagnostic significance. The authors conclude that the inguinal bubo is the less serious, superficial form of the disease and that the infectiousness of the late forms makes the prognosis of lymphogranuloma inguinale less favorable than was formerly assumed.

Pulmonary Tuberculosis and Renal Diabetes.—Tannhauser relates the clinical histories of two patients with tuberculosis who also had renal diabetes; that is, the blood sugar content was low, the course of the blood sugar curve during a sugar tolerance test was normal, and the degree of glycosuria was not influenced by the intake of carbohydrates. The renal diabetes had no influence on the tuberculosis and the author

refrained from any effort to influence the glycosuria. He considers the knowledge of a concurrence of tuberculosis with renal diabetes important so that unnecessary dietary and insulin treatments can be avoided, for they not only would involve needless expense but also could cause dangers, particularly hypoglycemic shock.

Monatsschrift f. Geburtshülfe u. Gynäkologie, Berlin

92: 257-336 (Oct.) 1932

Tonometric Studies in Women at Various Stages of Reproductive Period. L. Bickel.—p. 257.
Contribution to Study of Menstrual Blood. A. W. Hochloff.—p. 269.
*Glycogen Regulation by Placenta During Pregnancy. H. Eufinger.—p. 272.
Pathologic Anatomic Changes in Ovary and End-Results After Long Continued Administration of Anterior Pituitary Hormone. J. Rosenblatt, W. Halber and A. Pruszczynski.—p. 284.
Primary and Recurring Tubal Pregnancy. B. Schiwowa, P. Garfunkel and J. Schapiro.—p. 292.
Indications and Technic of Colpocleisis. W. Rosenstein.—p. 296.
*Pulmonary Tuberculosis and Pregnancy. K. Hansen and F. Schultze-Rhonhof.—p. 301.

Glycogen Regulation by Placenta During Pregnancy.—Eufinger found that the glycogen content of the placenta diminishes as pregnancy progresses. The glycogen content of fetal livers, on the contrary, shows an increase. Apparently there exists a reciprocal action between the placenta and the fetal liver as regards glycogenic function. The placenta forms glycogen in the first half of pregnancy and exercises an active vital glycogenic function in the interest of the fetus. Toward the end of pregnancy the glycogenic function is taken over more and more by the fetal liver, the placenta becoming less and less concerned with it.

Tuberculosis and Pregnancy.—Hansen and Schultze-Rhonhof review the recent literature and present their own views on the subject of pregnancy in tuberculous persons. The general opinion still holds that gestation exerts an unfavorable influence on the tuberculous process. In severe cases the effect is more evident in the second half of pregnancy, in mild cases in the first half. The act of labor per se is most to be dreaded. Lazarevic and Waitz obtained a positive Pirquet test in 70 per cent of pregnant women. They point to it as proof of an increased vegetative lability and an increased tendency to activating any latent foci or infection. The authors lean to a more conservative attitude with regard to interruption of gestation. The extensive investigations of Blisnyanskaya in Russia strongly suggest that the social conditions and lack of treatment are more important aggravating factors than pregnancy per se. Under proper management, pregnancy was shown to be well tolerated not only in mild latent but even in more active cases. Interruption should be practiced before the fourth month and its performance in the second half of pregnancy is to be undertaken only as a life-saving measure. The authors stress the point that active treatment, particularly the surgical treatment, should not be suspended during pregnancy. Patients do particularly well after induction of a pneumothorax, after a phrenic exeresis, or even after thoracoplasty. No positive proof exists that children born of tuberculous parents are inferior. All authorities are agreed that infants should be isolated and nursing interdicted in open cases. Pregnancy must be interrupted in laryngeal tuberculosis. The complication of renal tuberculosis, according to Ravina, should be treated by a nephrectomy on the ground that extension of the process is certain to take place.

Münchener medizinische Wochenschrift, Munich

79: 1705-1744 (Oct. 21) 1932

Requirements of a Surgeon. A. Krecke.—p. 1705.
Urologic Dilettantism. F. Schlagintweit.—p. 1708.
*New Method of Examination of Blood for Diagnosis of Cancer. H. J. Fuchs.—p. 1711.
Thrombophlebitis Migrans of Peripheral Veins. E. Krieg.—p. 1712.
Torsion of Vermiform Appendix with Subsequent Mummification. G. B. Schmidt.—p. 1715.
Weather, Apoplexy and Embolism. F. Stengel.—p. 1716.
Medicinal Management of Delivery. K. Heyrowsky.—p. 1720.
Exact Method of Measuring Spreading of Malleolar Mortise. F. Rinecker.—p. 1721.

Blood Examination for Diagnosis of Cancer.—Fuchs first evaluates other cancer reactions, particularly that of Freund-Kaminer, for which the necessary fresh test materials are generally difficult to obtain. The method for the detection of cancer first described by the author in 1926 differs from other cancer reactions in that it does not employ a serologic technic but rather an exact chemical analysis, and the standardized reacting substances with which the serums are incubated are not taken from tissues but rather from the blood. He admits that in spite of efforts to eliminate all sources of error in the microchemical analysis mistakes are still possible, but they have been limited to a comparatively small percentage, so that statistical reports of a large material indicate that the reaction gives correct results in more than 90 per cent of cases. The method indicates the presence of cancer in the early stages but it does not indicate the location and type of the neoplasm. The efficacy of a treatment and the resistance of the organism are indicated in the reaction. Moreover, the test makes it possible to detect tuberculosis or syphilis and to differentiate these conditions from each other as well as from cancer.

Wiener klinische Wochenschrift, Vienna

45: 1305-1336 (Oct. 21) 1932

From Posthumous Works of Constantin von Economo. L. Horn and O. Pötzl.—p. 1305.
*Correlative Cortical Changes in Brain of Woman Blind in One Eye. L. Horn and M. Helfand.—p. 1309.
Efforts to Make Surgical Interventions Less Trying. R. Demel.—p. 1309.
*Helpful Preparations in Treatment of Chronic Arthritis. E. Maliwa.—p. 1313.
*Omphalitis Caused by Foreign Bodies. A. Schnaberth.—p. 1315.
Spasm of Mammilla. H. Beck.—p. 1316.
Conservative Treatment of Ureteral Calculi. W. K. Fränkel.—p. 1318.
Idem. W. Brandesky.—p. 1319.
Treatment of Tuberculosis of Larynx. E. Wessely.—p. 1320.
Trauma and Nervous System. E. Raimann.—p. 1321.
Etiology and Symptomatology of Sepsis. W. Falta.—p. 1325.

Cortical Changes in Woman Blind in One Eye.—Horn and Helfand point out that studies on the brain of a deaf-mute, which one of them carried on under the direction of von Economo, had revealed that the pathologic changes were not so much in the real acoustic area, in Heschl's convolution, as in the planum temporale; that is, in the cortical field behind Heschl's transverse convolution. This region of the planum temporale, however, has only indirect connections with the acoustic area, and for this reason the changes in this region have to be considered as correlative. This observation induced the authors to search for correlative changes in persons with unilateral blindness. The observations described in this paper were made on the brain of a woman who had lost the sight of her right eye ten years previously as the result of a serpiginous ulcer of the cornea. Noticeable changes were found only in the left hemisphere, that is, contralateral to the right eye, which had been blind for ten years. The authors consider this a correlative change of a similar type to that observed in the brain of the deaf-mute.

Treatment of Chronic Arthritis.—Maliwa describes two new remedies for oral administration that are entirely outside the range of medicines formerly employed in the treatment of chronic infectious arthritis. The indications for the use of these preparations are strictly defined. The first medicament, namely, dragées containing gold, is indicated in subfebrile chronic arthritis to influence the infectious process. This gold therapy may if necessary be complemented by local physical treatment, the latter having better prospects of success following the gold medication. The author recommends the second medicament, pyridium, as an antibacterial remedy to counteract septic relapses in the course of chronic infectious arthritis.

Omphalitis Caused by Foreign Bodies.—Schnaberth describes a form of omphalitis that he considers as an occupational disease of farm laborers. It is caused by the spicules of the cereal grasses, particularly of barley, which because of the generally scanty clothing of the workers during the harvesting season can easily enter into the umbilicus. Extraction of the spicules and application of a disinfectant powder usually lead to rapid cure. However, the author thinks that this form of omphalitis may occasionally lead to an infection with Actinomyces. He points out that the literature relates cases of peritoneal actinomycosis, in which the port of entry of the fungus was not detectable, and a primary focus in the gastrointestinal canal was assumed. He thinks that such doubtful cases could perhaps be explained by the described umbilical inflammation if the anamnesis should reveal its previous occurrence.

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JOURNALS ABSTRACTED IN THE CURRENT MEDICAL LITERATURE DEPARTMENT, JULY-DECEMBER, 1932.

Abstracts of important articles in the following journals have been made in the Current Literature Department of THE JOURNAL during the past six months. Any of the journals, except those starred, will be lent by THE JOURNAL to subscribers in continental United States and Canada and to Fellows of the American Medical Association for a period not exceeding three days. Two journals may be borrowed at a time. No journals are available prior to 1925. Requests for periodicals should be addressed to the Library of the American Medical Association and should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Thus most of these journals are accessible to the general practitioner.

Acta Chirurgica Scandinavica. Stockholm.
Acta Dermato-Venereologica. Stockholm.
Actas de la Sociedad de Cirugia de Madrid.
American Heart Journal. St. Louis.
American Journal of Anatomy. Philadelphia.
American Journal of Cancer. New York.
American Journal of Clinical Pathology. Baltimore.
*American Journal of Diseases of Children. A. M. A., Chicago.
American Journal of Hygiene. Baltimore.
American Journal of the Medical Sciences. Philadelphia.
American Journal of Obstetrics and Gynecology. St. Louis.
American Journal of Ophthalmology. St. Louis.
American Journal of Orthopsychiatry. Menasha, Wis.
American Journal of Pathology. Boston.
American Journal of Physical Therapy. Chicago.
American Journal of Physiology. Baltimore.
American Journal of Psychiatry. Baltimore.
American Journal of Public Health. New York.
American Journal of Roentgenol. & Rad. Therapy. Springfield, Ill.
American Journal of Surgery. New York.
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Annals of Internal Medicine. Ann Arbor, Mich.
Annals of Medical History. New York.
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Archiv für Hygiene und Bakteriologie. Munich.
Archiv für Kinderheilkunde. Stuttgart.
Archiv für klinische Chirurgie. Berlin.
Archiv für Psychiatrie und Nervenkrankheiten. Berlin.
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*Archives of Dermatology and Syphilology. A. M. A., Chicago.
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*Cannot be lent.

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Zeitschrift für Urologie. Leipzig.
Zeitschrift für urologische Chirurgie. Berlin.
Zentralblatt für Chirurgie. Leipzig.
Zentralblatt für Gynäkologie. Leipzig.

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SUBJECT INDEX

This is an index to all the reading matter in THE JOURNAL. In the Current Medical Literature Department only the articles which have been abstracted are indexed.

The letters used to explain in which department the matter indexed appears are as follows: "BI," Bureau of Investigation; "E," Editorial; "C," Correspondence; "ME," Medical Economics; "ab," abstract; the star (*) indicates an original article in THE JOURNAL.

This is a subject index and one should, therefore, look for the subject word, with the following exceptions: "Book Notices," "Deaths," "Medicolegal Abstracts" and "Societies" are indexed under these titles at the end of the letters "B," "D," "M," and "S." State board examinations are entered under the general heading State Board Reports, and not under the names of the individual states. Matter pertaining to the Association is indexed under "American Medical Association." The name of the author, in brackets, follows the subject entry.

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Acad.—Academy	*M.—Medical*
Am.—American	*Med.—Medicine*
A.—Association	*Nat.—National*
Coll.—College	*Phar.—Pharmaceutical*
Conf.—Conference	*Phys.—Physicians*
Cong.—Congress	*Rev.—Revision*
Conv.—Convention	*Ry.—Railway*
Dist.—District	*S.—Surgical*
Hosp.—Hospital	*Soc.—Society*
Internat.—International	*Surg.—Surgery, Surgeons*

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